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A STUDY OF THE NATURE AND CONTROL OF AIR-BORNE INFECTION IN ARMY CAMPS

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The study of air-borne infection is of relatively recent origin. Several circumstances in particular have accelerated investigation in this field during the past two to three years, namely the development of more efficient and quantitative methods for recovering bacteria from the air, progress in methods of aerial disinfection and the war. The fact that between one third and one half of all illness in army camps is caused by diseases of the respiratory tract coupled with the lack of any effective measures for reducing the incidence of such diseases indicated the urgency of intensive study of this problem in the Army. Before the war began, a number of special commissions were set up under the Board for the Investigation and Control of Influenza and Other Epidemic Diseases, Preventive Medicine Service, Office of the Surgeon General, U. S. Army. Certain of these commissions were assigned to study different specific diseases of the respiratory tract and one to the general problem of air-borne infection. The Commission on Air-Borne Infections [1] has had the opportunity during the past two and a half years to carry on a study of this subject both in the laboratory at the University of Chicago and in the field at Chanute Field, Camp Carson and Peterson Field.[2] While the ultimate aim of these investigations was the development of measures to reduce the incidence of acute diseases of the respiratory tract in army camps, it was evident that much more knowledge concerning the nature of air-borne disease would have to be obtained before effective means of control could be devised. Such essential information comprised a better understanding of (1) the sources from which infectious agents are dispersed into the air, (2) the relationship of aerial contamination to the spread of disease and (3) the various factors which influence the survival of pathogenic agents in the environment.

In designating an infectious disease as air borne, it should be kept in mind that this descriptive term indicates that the disease may be transmitted through the air or perhaps is acquired principally by this route but does not exclude other modes of transmission. Thus, secretions carrying the etiologic agents of acute respiratory disease may be passed to the new host directly by contact of lips or hands or less directly through contaminated food, eating utensils and other objects. Infection through the air may occur either from exposure, at close proximity to diseased persons who eject large numbers of infectious droplets in sneezing, coughing and talking [3] or as a result of inhaling particulate infectious material floating in the atmosphere of an enclosed space either at a distance from or subsequent to the departure of the diseased person. The area of high atmospheric infectivity resulting from coughing or sneezing is probably a relatively small one. Jennison's [4] stroboscopic photographs of a sneeze show that the droplets are projected not more than 2 to 3 feet and Hare's [5] experiments with cough plates placed in an arc in front of the subject indicate an even shorter distance of dispersion produced by a cough. The larger droplets, constituting the bulk of the infectious secretion, settle out quickly to the floor or other surfaces, and the smaller ones of 2 to 3 microns or less evaporate rapidly and are carried away on air currents. Certain of the earlier workers in this field considered that such small dried "droplet nuclei" (Wells [6]) constituted the principal source of infectious particles in the air. More recently English and Canadian investigators [7] have shown that bedclothes and floor dust in the vicinity of patients suffering from certain diseases of the respira-

Wholehearted cooperation was extended by many medical and line officers in the army camps in which these studies were conducted.

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From the Department of Medicine, the Douglas Smith Foundation for Medical Research and the Bartlett Memorial Fund of the University of Chicago, and from the Commission on Air-Borne Infections, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, U. S. Army.

1. Previously designated as the Commission on Cross Infections in Hospitals.

2. Much of the unpublished work of the commission is referred to in various parts of the paper. These observations will be reported later in full by the various members of the group.

3. Jennison's [4] stroboscopic photographs show that the relative numbers of droplets produced by these activities is in the order named. Sneezing is by far the most productive of aerial contamination. Most of the droplets, however, leave by way of the mouth.

4. Jennison, M. W.: Atomizing of Mouth and Nose Secretions into the Air as Revealed by High Speed Photography, in Moulton, F. R.: Aerobiology, Publication 17, American Association for the Advancement of Science, 1941, pp. 106-128.

5. Hare, R.: The Expulsion of Hemolytic Streptococci by Nasopharyngeal Carriers, Canad. Pub. Health J. **31**: 539 555, 1940.

6. Wells, W. F.: Air-Borne Infection: II. Droplets and Droplet Nuclei, Am. J. Hyg. **20**: 611-618, 1934.

7. Van den Ende, M.; Lush, D., and Edward, D. G. F.: Reduction of Dust Borne Bacteria by Treating Floors, Lancet **2**: 133-134, 1940. Thomas, J. C., and Van den Ende, M.: The Reduction of Dust Borne Bacteria in the Air of Hospital Wards by Liquid Paraffin Treatment of Bedclothes, Brit. M. J. **1**: 953-958, 1941. Willits, R. E., and Hare, R.: The Mechanism of Cross Infection of Wounds in Hospitals by Hemolytic Streptococci, Canad. M. A. J. **45**: 479-488, 1941.

tory tract constitute reservoirs from which infectious agents are redispersed into the air on agitation. We were able to confirm readily the finding that disturbance of the environment, bedclothes and floor dust of patients suffering from one type of respiratory infection, namely hemolytic streptococcus, caused an increase in the number of these micro-organisms in the air but were then faced with the problem of the relative importance of these sources of pathogenic bacteria as contributing to aerial contamination.

In order to recover bacteria from the air and other parts of the environment in a quantitative manner it was necessary to devise special apparatus for this purpose. Two kinds of bacterial air samplers have been developed. One utilizes the principle of atomization to trap the bacterial particles in broth.[8] It is simple in operation and highly efficient and will recover 90 to 95 per cent or more of bacteria from air sampled at the rate of 1 cubic foot per minute. Aliquots of the broth are plated in blood agar. The other, pictured in figure 1, is of simpler design and operates by bubbling air at an equally rapid rate into a large test tube containing broth, with two or three drops of sterile olive oil added to prevent foaming. The rapid dispersion of the air through the fluid against the test tube walls results in the retention in the broth of approximately 90 per cent of air-suspended bacteria. While the efficiency of this apparatus is slightly less than that of the atomizer sampler, the fact that it requires no special glass blowing skill for construction and can be made up in any numbers from readily purchasable glassware renders it more generally usable.[9] With both types of sampler the air flow is measured by a simple flowmeter designed for this purpose[10] (fig. 1). For culturing bedclothes or the floor, a funnel is attached by means of a rubber tube to the inlet of the "bubbler sampler" and it is used in the same manner as a vacuum cleaner. Blood agar plates exposed for varying periods of time were employed as a concomitant means for detecting the presence of air-borne bacteria. The usefulness and limitations of this method are described elsewhere.[11]

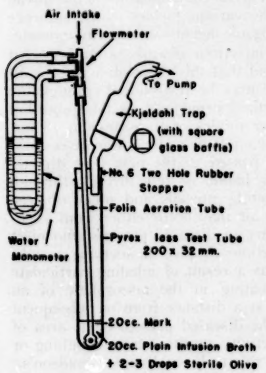

Fig. 1.—Apparatus for collection of bacteria from the air.

Since hemolytic streptococcus infection of the upper respiratory tract constitutes a prevalent and important disease, and since this micro-organism is much easier to isolate and trace than any other respiratory disease agent, our investigations in army hospitals and barracks have been centered principally on the hemolytic streptococcus. We have amplified the field observations by studies in the laboratory on this and other respiratory pathogens, e. g. pneumococcus, staphylococcus and influenza virus.

SOURCES FROM WHICH STREPTOCOCCI ARE DISPERSED INTO THE AIR

As others have previously found and as we have been able to demonstrate clearly in barracks[12] and wards,[11] the bacterial population in the air is in general proportional to the number of persons in the occupied space and the degree of their activity. The total number of bacteria in the air of an occupied barrack is at its lowest when the men are sleeping and may rise from less than 100 per cubic foot at this time to many thousands during the peak of morning activity: getting up, dressing, bedmaking and sweeping (fig. 3). Similarly, in environments (wards) occupied by patients with active streptococcic nasopharyngitis or scarlet fever, air samples taken while the ward was quiet yielded fewer than 2 hemolytic streptococci per cubic foot of air, whereas during dry sweeping or bedmaking the counts increased frequently to 15 or 20. Cultures of the bedclothes and floor dust in such wards revealed pronounced contamination of several or many of the beds and the floor round about. From 10,000 to 100,000 or more hemolytic streptococci could be recovered from a single sheet or blanket on the beds of certain patients and a million or more from the dust under the bed. Furthermore, it was found that streptococci could be recovered from pajamas and other clothing as well as from the skin of the patient.

Our observations left no doubt that disturbance of bedding, clothing and floor contributed greatly to the numbers of hemolytic streptococci in the air but that such increases were temporary, lasting not much beyond the period of disturbance, and hence the question as to whether the bulk of air-borne streptococci present during the quiet periods came directly from the patients as fine droplets or on dust and lint from the secondary reservoirs remained unanswered. A conclusive answer to this question may not be very important, since we have evidence both experimental and clinical[13] that dosage is very important in determining whether or not air-borne infection occurs, and it may well be that infection is much more likely to occur in the relatively brief periods of high concentration of streptococci or other disease agents in the air than at other times. Furthermore, a certain degree of disturbance of the secondary reservoirs is constantly occurring as long as there are occupants in the space. Observations in barracks contaminated with hemolytic streptococci tend to bear this out.

RELATIONSHIP OF AERIAL CONTAMINATION TO SPREAD OF DISEASE

Cultures of the air in wards where secondary or cross infections with hemolytic streptococci were occurring have revealed the presence of those streptococcus types causing the infections. Furthermore, when such infections were caused by several different types the

8. Moulton, S.; Puck, T. T., and Lemon, H. M.: An Apparatus for Determination of the Bacterial Content of Air, Science **97**: 51-52, 1943.
9. Lemon, H. M.: A Method for Collection of Bacteria from Air and Textiles, Proc. Soc. Exper. Biol. & Med. **54**: 298-301, 1943.
10. Lemon, H. M., and Wise, H.: A Flowmeter for Use in Air Sampling Procedures, Science **99**: 43-44, 1944.
11. Hamburger, M.; Puck, T. T.; Hamburger, V. G., and Johnson, M. A.: Studies on the Transmission of Hemolytic Streptococcus Infections: III. Hemolytic Streptococci in the Air, Floor Dust and Bedclothes of Hospital Wards and Their Relation to Cross Infections, J. Infect. Dis. **75**: 71-78, 1944.
12. Lemon, H. M.; Wise, H., and Hamburger, M., Jr.: The Bacterial Content of Air in Army Barracks with Especial Reference to the Dispersion of Bacteria by the Air Circulation System, War Med. **6**: 92-101 (Aug.) 1944.
13. Loosli, C. G.; Robertson, O. H., and Puck, T. T.: The Production of Experimental Influenza in Mice by Inhalation of Atmospheres Containing Influenza Virus Dispersed as Fine Droplets, J. Infect. Dis. **72**: 142-153, 1943. Hamburger, Puck, Hamburger and Johnson.[11]

predominant air-borne streptococcus was found to be of the same type as that causing the largest number of infections. Occasionally a series of cross infections were due to a single type and only this type of streptococcus was isolated from the air. In 1 such instance a type 17 hemolytic streptococcus was isolated from the air of a ward housing "common respiratory disease" patients two days before the first infection, scarlet fever due to type 17, occurred. In the ensuing five days, during which time air cultures showed a great increase in the numbers of type 17 hemolytic streptococci, 7 additional patients became infected with this particular micro-organism, some with scarlet fever, others with tonsillitis.[11]

Studies in barracks have shown the same association between air-borne streptococci and the occurrence of infection due to a given type of hemolytic streptococcus. In several instances in which one whole story of a barrack has shown definite contamination of the bedclothes and floor dust with a predominant type of streptococcus (the same as that of the initially infected person) cultures of the air have revealed only this type or relatively few streptococci of another type. In two such barracks, all of the ten or more infections occurring during a brief interval of time were due to this one predominant type.

The relationship of hemolytic streptococcus carriers to aerial contamination and spread of infection until recently has been largely conjectural. Earlier studies showed that the presence of even a high percentage of persons (as many as 50 per cent of the patients in a 32 bed ward) harboring group A streptococci in their throats might not result in secondary infections or new carriers,[14] or more than a minimal contamination of the air with these micro-organisms. On the other hand the introduction into a respiratory disease ward of a single individual carrier (infected, convalescent or well person) of any one of a number of group A hemolytic streptococcus types was sometimes followed by a widespread dispersal of these micro-organisms in the environment and multiple cross infections with the specific type. Quantitative bacteriologic studies of the bedclothes, hands and air in the immediate environment of such individuals have shown that they are capable of rapid and definite contamination of their surroundings. Further investigation showed that the saliva of many of these "dispersers" contained large numbers of hemolytic streptococci but revealed no quantitative relationship between streptococcus saliva content and dispersing capacity. It was not until culturing of the nose as well as the throat was instituted that a means of detection of the "dangerous carrier" was found. An extensive series of observations has shown (1) that patients whose nose cultures were strongly positive expelled hundreds to thousands as many hemolytic streptococci as those individuals whose nose cultures were negative and (2) that all patients or carriers responsible for the infection of other persons were found to exhibit positive nose cultures, although not every individual whose nose culture was positive expelled very large numbers of hemolytic streptococci.

While the foregoing observations provide no conclusive proof that streptococcic infection of the respiratory tract does occur through the medium of the air, a considerable body of indirect evidence strongly supports this assumption. Furthermore, experimental air-borne transmission to animals of certain human diseases, e. g. streptococcic, pneumococcic and influenza infections, leaves little doubt that human beings may contract these infections in the same manner. This subject has been reviewed in an earlier publication.[15]

14. Hamburger, M., Jr.: Studies on the Transmission of Hemolytic Streptococcus Infections: I. Cross Infection in Army Hospital Wards, J. Infect. Dis. **75**: 58-70, 1944.

FACTORS INFLUENCING THE SURVIVAL OF PATHOGENIC AGENTS IN THE ENVIRONMENT

Knowledge of the length of time disease agents of the respiratory tract can survive outside the body under varying conditions is essential to an understanding of the various aspects of air-borne infection. While this field has not been adequately explored, certain facts have been brought out. Others[16] have observed that light and heat shorten the life span of certain pathogenic bacteria. In addition we have found that atmospheric humidity plays a very important role in determining the duration of viability of several different disease agents. Hemolytic streptococci suspended in saliva and dispersed as a fine mist into a dry atmosphere can be recovered from the air twenty-four hours later.[17] Blankets contaminated with hemolytic streptococci have been isolated in a dry atmosphere and when sampled at the end of four months still exhibited considerable numbers of these micro-organisms. Although adequate comparative studies in atmospheres of high relative humidity have not been carried out in the case of the streptococcus, preliminary tests indicate that in a moist atmosphere their viability is much briefer. However, the effect of varying humidity on air-borne influenza virus has been studied extensively. It was found that in relative humidities of 80 to 90 per cent the virus survived less than one hour but could be detected in dry air of 25 to 30 per cent humidity at the end of thirty-six hours.[18] Furthermore, living influenza virus could be recovered from the air following shaking of a canvas floor covering as long as six days after it had been sprayed into a room with a dry atmosphere.[19] The latter finding indicates that under suitable conditions influenza and not improbably other respiratory disease viruses may accumulate in the patient's environment and be redistributed into the air in the same manner as bacteria.

CONTROL OF SECONDARY RESERVOIRS OF INFECTION

It became evident from these studies that a successful attack on the problem of the prevention of air-borne infection must include control of the secondary reservoirs of disease agents in addition to measures for disinfecting the air, such as glycol vapors or ultraviolet radiation.

(*a*) *Floor Treatment to Hold Dust and Lint.*—A number of compounds for floor treatment were tested by means of scattering dust and fine lint on the treated areas and observing through a microscope the holding power of the surface when a strong breeze from an electric fan was directed on it. On wood floors a single coat of pale paraffin oil was found to be highly effective

15. Robertson, O. H.: Air-Borne Infection, Science **97**: 495-502, 1943.
16. Buchbinder, L.; Solowey, M., and Phelps, E.: Studies on Micro-Organisms in Simulated Room Environments: III. The Survival Rates of Streptococci in the Presence of Natural, Daylight and Sunlight, and Artificial Illumination, J. Bact. **42**: 353-366, 1941. Enders, S. F., and Shaffer, M. F.: Studies on Natural Immunity to Pneumococcus Type III: I. The Capacity of Strains of Pneumococcus Type III to Grow at 41 C. and Their Virulence for Rabbits, J. Exper. Med. **64**: 7-18, 1936.
17. Robertson, O. H.: Sterilization of Air with Glycol Vapors, in Harvey Lectures, 1942-1943, Baltimore, Williams & Wilkins Company, 1943, vol. 38, pp. 227-254.
18. Loosli, C. G.; Lemon, H. M.; Robertson, O. H., and Appel, E.: Experimental Air-Borne Infection: I. Influence of Humidity on Survival of Virus in Air, Proc. Soc. Exper. Biol. & Med. **53**: 205-206, 1943.
19. Loosli, C. G.; Appel, E.; Robertson, O. H., and Lemon, H. M.: The Influence of Humidity on the Survival of Influenza Virus in the Air and Dust, to be published.

in holding both lint and dust. Tests repeated over a period of many weeks showed this property to be undiminished. Van den Ende[7] and Thomas[7] used spindle oil for this purpose. For highly polished floors and linoleum, which were made somewhat slippery by oil, a compound consisting of urea 5 per cent, ninol[20] 3 per cent and roccal[21] 0.1 per cent was found to be satisfactory. This mixture dried quickly but held enough moisture in the urea crystals and ninol to produce wetting of particular matter falling on its surface. Furthermore, the treated surface exerted a bactericidal action. The disadvantage of the urea-ninol-roccal compound is that it must be reapplied frequently and can be employed only on nonporous surfaces.

(*b*) *Method for Oil Treatment of Bedclothes.*—It seemed obvious that the ideal treatment of bedding would be one that rendered it bactericidal as well as dustless and lintless. However, after a long series of experiments with a considerable number of different preparations both bactericidal and nonbactericidal, it became evident that any agent which would simply hold particulate matter in the blanket or other material was just as effective in preventing dispersal of bacteria into the air as one which might exert a germicidal action. It was found that medicinal liquid petrolatum was an excellent agent for this purpose. Oil treatment of blankets was first investigated by certain English workers,[22] but the formulas which they employed contained ingredients that made them unsatisfactory for practical use.

The principal problems were, first, to develop a satisfactory method for applying oil to blankets, sheets and the like and, second, to devise a simple and rapid means for testing the effectiveness of an oil application in retaining lint and bacteria. Oil treatment of bedding was found to be most adequately achieved by means of water-oil emulsions which were employed as a final rinse in the laundering process. These emulsions had

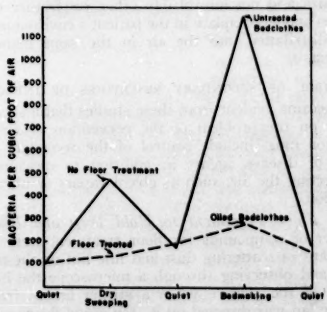

Fig. 2.—Reduction in bacterial content of ward air by floor treatment and use of oiled bedclothes. Consecutive air samples, twenty minutes each. Solid line, control periods; broken line, period of treatment.

to meet certain requirements, namely very fine dispersion, stability, lack of any irritation to the skin and absence of odor. A base for an oil emulsion which most nearly met these requirements consisted of mineral oil (Fractol A) 88.0 Gm., oleic acid (purified) 8.9 Gm., triethanolamine 3.9 Gm. and lecithin 0.01 Gm.[23] When poured into water and mixed well, a milky emulsion results which consists of particles so fine that they exhibit brownian movement. Patch tests on 175 persons with a 25 per cent emulsion of the oil base were all negative.[24] The percentage of oil in the treated material was determined by extracting the oil from the test sample with chloroform and then evaporating the solvent and weighing the residue.

In order to test the effectiveness of the different oil preparations (principally the varying percentages of oil in the fabric) a method was devised in which counts were made of the number of particles released from the treated fabric following a uniform degree of agitation. Blankets treated with 1 or 2 per cent oil emulsions and tested in this manner exhibited a reduction of 95 to 98 per cent in the lint and bacteria released as compared with control pieces of the same blanket. Such treated blankets and other bedclothes were indistinguishable to smell or touch from untreated ones.

It was essential to determine whether oiling of bedclothes, especially blankets, contributed any increased fire hazard. An extensive series of combustion and ignition tests on oil-treated blankets, comforters and sheets undertaken by the National Bureau of Standards showed that percentages of oil considerably above the maximum which we proposed to employ (namely, 3 to 4 per cent) involved no fire risk.[25]

TESTS OF THE EFFECTIVENESS OF OILING FLOORS AND BEDDING

(*a*) *On Bacterial Content of Air.*—Tests of these relatively simple means for dust control were carried out in army hospital wards and barracks. In wards it was found that the rise in bacterial content of the air resulting from dry sweeping the untreated floor was almost entirely prevented by previous mopping or by preparation of the floor with the urea-ninol-roccal compound. The dust-retaining effect of the floor compound lasted much longer than did that of mopping alone and resulted in lower bacterial counts during periods of relative quietness in the ward. It was necessary, however, to reapply the floor compound daily. The use of oiled bedclothes brought about an almost equally striking reduction in the aerial dispersion of bacteria which ordinarily occurs during bedmaking. These effects are shown in figure 2. Equivalent reduction in the numbers of air-borne hemolytic streptococci was obtained. The bacterial counts and the percentage of reductions brought about by oiling the bedclothes are given in the accompanying table.

In barracks, which represent a much dustier environment than hospital wards, the results of oiling were even more striking. To determine the maximum effects of these dust control measures it was necessary to secure cultures of the air before, during and after the daily period of greatest activity in the barracks. The first air samples were taken when the occupants were all asleep and continued through a period of two hours while the men were getting up, dressing, making beds and being otherwise occupied. The rise and fall in

20. A synthetic detergent manufactured by the Ninol Laboratories, Chicago.
21. The commercial form of Zephiran, supplied by the Alba Pharmaceutical Company, New York.
22. Van den Ende, Lush and Edward.[7] Thomas and Van den Ende.[7]
23. This is a modification of an emulsion described by the Carbide and Carbon Chemicals Corporation.
24. While this emulsion has been the one principally used in our study and many thousands of bedclothes have been treated by this means with satisfactory results, we have found that certain difficulties may be encountered in its routine use in laundry procedures. For this reason we are testing other emulsions which give promise of eliminating these difficulties. Details of this subject, together with an account of the laundry procedures involved in oiling bedclothes, will be published.
25. Dr. Lyman J. Briggs, director of the National Bureau of Standards, and Mr. S. H. Ingberg, chief of the Fire Resistance Section, made these studies.

the numbers of bacteria in the air of a barracks during this time is shown by the graph in figure 3, which represents the average of more than 300 air cultures taken in treated and untreated barracks housing men of the same company. It will be observed that oiling the floors reduced by approximately 70 per cent the peak in the number of air-borne bacteria which occurred in the control barracks during the same period of maximum

Effect of Oiled Bedclothes on the Bacterial Content of Ward Air During Bedmaking

	Total Bacteria per Cubic Foot		Hemolytic Streptococci per 10 Cubic Feet	
	Quiet Period	During Bedmaking	Quiet Period	During Bedmaking
Untreated bedclothes	118	938	6	24
Treated bedclothes	75	276	0	4
Per cent reduction by treated bedclothes	36.4	70.6	100	83.3

Each figure is an average of about ten days' tests on a twelve bed ward contining 9 to 12 patients.

activity. Oiled bedding plus oiled floors effected a further reduction to about 90 per cent of the bacterial counts in the control barracks. In fact, activity of the occupants of the completely oiled barracks caused very little change in the number of air-suspended bacteria. The small early morning rise shown in the graph might well be associated with the liberation of bacteria from the men's clothing during dressing. Though hemolytic streptococci were seldom found in the air of the oiled barracks, very large numbers were not infrequently recovered from the air of untreated ones.

(*b*) *On Bacteria Recoverable from Blankets.*—An extensive series of cultures from oiled blankets in barracks with oiled floors yielded only about one-seventh the number of bacteria recovered from untreated but washed blankets in control barracks. Very few hemolytic streptococci were obtained from the oiled blankets, while in numerous instances great numbers were recovered from unoiled blankets. Tests repeated during a period of two months after placing the oiled blankets on the beds showed no apparent diminution in their bacteria-holding property.

(*c*) *On the Incidence of Acute Respiratory Infection.*—In view of these results and the difficulty of utilizing glycol vapors or ultraviolet radiation in a large number of barracks, a study of the effect of oiling floors and bedclothes on the incidence of acute respiratory disease in a considerable body of troops was instituted. The major part of the test consisted in the oiling of every other barracks. In certain areas the company constituted the test and control unit. The number of hospital admissions for acute infections of the respiratory tract was chosen as the index of comparison. At the date of writing the test has not extended over a sufficient period of time to permit final conclusions, nor have the considerable body of data already at hand been adequately analyzed; but it may be said that the results so far obtained point to a significant reduction in the number of hospital admissions for acute respiratory disease from the oiled barracks.

USE OF TRIETHYLENE GLYCOL VAPOR

We have practically no information concerning the minimum concentration of any air-borne disease agent necessary to produce infection of the exposed individual and only very meager data on the numbers of hemolytic streptococci in the air of environments where infections with this micro-organism are taking place. Certain evidence derived from experimental air-borne infection in animals indicates that dosage is a determining factor and depends on the concentration of the infectious agent in the inhaled air and the length of the exposure or both. It has been found that if the concentration in the air of a given disease agent, e. g. influenza virus, falls below a certain level, animals breathing the air even for a long period of time fail to contract infection, in spite of the inhalation of detectable amounts which can be demonstrated by suitable methods. Thus it seems not unlikely that in certain situations appropriate measures for controlling dispersal of infectious agents from secondary reservoirs might hold their concentration in the air at a sufficiently low level that even highly susceptible persons would escape infection. However, we know from experience that, even though the incidence of respiratory disease in such controlled environments can be reduced, infections may still continue to occur. Whether these are due to a minimum dispersion of disease agents from contaminated surfaces or to droplets ejected directly from the infectious individuals or to exposure outside the living quarters is not known. At any rate it seems evident that more complete control of the transmission of acute infection of the respiratory tract requires some form of aerial disinfection.

Ultraviolet radiation has been employed for this purpose for some time and is now receiving further extensive tests under controlled conditions by one of the other branches of the armed forces. The use of certain glycol vapors offers another method for killing air-borne disease agents. It has been found that some of the glycols, especially propylene glycol and triethylene glycol, when dispersed into an enclosed atmosphere in vapor form, exert a very strong lethal action on pathogenic bacteria of the respiratory tract as well as on influenza virus.[26] The amounts required to produce a germicidal atmosphere are so small that relatively large

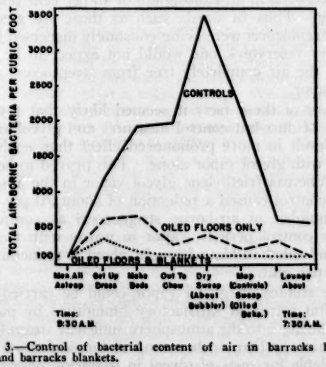

Fig. 3.—Control of bacterial content of air in barracks by oiling floors and barracks blankets.

spaces could be treated at low cost. A concentration of 1 cc. of triethylene glycol vaporized into 10,000 cubic feet of air produces almost immediate death of pneumococci, streptococci and influenza virus previously dis-

26. Robertson, O. H.; Bigg, E.; Puck, T. T., and Miller, B. F.: The Bactericidal Action of Propylene Glycol Vapor on Micro-Organisms Suspended in Air: I., J. Exper. Med. **78**: 593-610, 1942. Puck, T. T.; Robertson, O. H., and Lemon, H. M.: The Bactericidal Action of Propylene Glycol Vapor on Micro-Organisms Suspended in Air: II. The Influence of Various Factors on the Activity of the Vapor, J. Exper. Med. **78**: 387-406, 1943.

persed into the test room. Triethylene glycol vapor in bactericidal concentrations is not detectable in the air and is nontoxic.[17] Practical tests of this method have been delayed because of the lack, until recently, of adequate vaporizing apparatus and the need for an automatic control of the concentration of glycol vapor in the atmosphere. Two types of glycol vaporizers have recently been developed [27] and an apparatus for regulating the amount of glycol vapor in the air (glycostat) has now been devised.[27a] With this necessary equipment it has been possible to initiate certain preliminary studies on the effect of triethylene glycol vapor on a specific disease agent present in the air under natural conditions, namely the hemolytic streptococcus. It was found that the continuous vaporization of glycol into wards housing patients with acute hemolytic streptococcus nasopharyngitis resulted in a pronounced reduction in the numbers of air-borne streptococci as compared with cultures of the air made before and after the periods of vaporization. That complete sterilization of the air was not achieved can be accounted for on the basis of certain factors which limit the activity of the glycol vapor, one of the most important being atmospheric humidity. Tests in the laboratory showed that a certain amount of moisture in the air was essential. Relative humidities of 40 to 60 per cent were optimum for the germicidal action of the vapors. With the humidity below 30 per cent little effect on dried bacterial particles was observed, although freshly atomized cultures were killed at much lower humidities. The bacterial particle must contain or acquire a certain amount of moisture before it will attract and hold a sufficient number of the glycol molecules so that a lethal concentration of this substance accumulates around the bacteria. Furthermore, dried bacteria such as are dispersed into the air from surfaces require a certain period of time, ten to twenty minutes, to become adequately moistened even in an atmosphere of 40 per cent relative humidity. Thus in wards such as those we studied, where streptococci were being constantly dispersed from secondary reservoirs, one would not expect to be able to keep the air completely free from streptococci with glycol vapor.

In view of these facts it seemed likely that a combination of dust-lint control measures and glycol vapor would result in more pronounced effect than could be secured with glycol vapor alone. This proved to be the case. Whereas triethylene glycol vapor in the absence of dust control caused a reduction of about 70 per cent in the number of air-borne streptococci as compared with the control periods, vapor in wards with treated floors and oiled bedding brought about a reduction of over 90 per cent.

While studies on glycol vapor could be carried out in hospital wards at satisfactory humidities by means of introducing into the atmosphere sufficient steam from the radiator system, such means of humidification are not available for tests of glycol in barracks, where the relative humidity in many localities in winter time is very low. The introduction of a large amount of water vapor with the glycol might be the solution to this problem in climates of moderate dryness. Other methods of humidification of barracks are under study. Among the many phases of this subject still to be investigated is that of determining the minimum relative humidity at which a known continuous concentration of triethylene glycol is effective. With the glycostat available this will be possible to determine. It is not unlikely that a relative humidity which is below the optimum for germicidal action on dried bacterial or virus particles would still be highly effective for freshly expelled droplets of infected secretions.

The only published data on the use of glycol vapors for the control of acute respiratory disease are those of Harris and Stokes,[28] who observed a considerable reduction in the incidence of colds and other infections of the upper respiratory tract in children occupying wards treated with propylene or triethylene glycol vapor as compared with untreated wards.

COMMENT

The reader may well question the assumption implicit in the latter part of this presentation, having to do with control measures, that the greater proportion of upper respiratory tract infections are acquired in the barracks. It must be granted that definite information on this point is lacking. However, there is a good deal of evidence in support of the view that certain specific diseases are spread principally in sleeping quarters. One of the most informative studies of this subject was made by Dudley [29] in 1920, who found in a group of boys, part of whom lived in dormitories and part of whom slept in dispersed quarters outside, that, although all the boys ate together and mixed intimately during the day, an epidemic of scarlet fever and diphtheria affected only those living in the dormitories. Our own observations cited earlier in this study of several instances in which a number of cases of hemolytic streptococcus infection of a single type occurred in barracks heavily contaminated with this micro-organism strongly suggest that these infections were acquired in the barracks. Other accounts of similar episodes, though less carefully studied, support the inference that, at least where the disease rate of these particular infections is high, sleeping quarters constitute an important focus of dissemination. No information is available concerning the proportion of respiratory infections acquired inside and outside the barracks. The usual scattering of cases of the so-called common respiratory disease is generally considered to indicate that most of these infections are acquired by outside contact. Likewise where sporadic cases of streptococcic disease are occurring, no definite locus of infection is evident. Yet further investigation, such as the results of dust control measures in barracks, may show that a considerable percentage of respiratory disease, in general, is communicated in the environment of the sleeping quarters where the soldier spends the greater part of his indoor life and where conditions for accumulation and dispersal of disease agents are optimum.

We wish to point out that the fundamental ideas for the control of the secondary reservoirs of disease agents were proposed by the English workers. Thomas [7] found that oiling floor and bedclothes resulted in a 90 per cent reduction of air-borne bacteria in a hospital

27. One has been made by the Research Corporation of New York and the other by Drs. Bigg and Jennings of the Technological Institute of Northwestern University.

27a. Puck, T.; Wise, H., and Robertson, O. H.: A Device for Automatically Controlling the Concentration of Glycol Vapors in the Air, J. Exper. Med. **80**: 377-381, 1944.

28. Harris, T. N., and Stokes, J., Jr.: Air-Borne Cross Infection in Case of Common Cold: Further Clinical Study of Use of Glycol Vapors for Air Sterilization, Am. J. M. Sc. **206**: 631-636, 1943.

29. Dudley, S. F.: The Schick Test, Diphtheria and Scarlet Fever, Medical Research Council, Special Report Series, no. 75, London, His Majesty's Stationery Office, 1923; The Spread of "Droplet Infection" in Semi-Isolated Communities, Medical Research Council, Special Report Series, no 111, ibid. 1926.

ward, approximately the same result obtained by us in army barracks. Recent observations by Krueger and his associates [30] have corroborated the findings of others that oiling the floors alone brings about a substantial diminution in the number of air-borne bacteria in hospital wards. Also Feasby and Bynoe [31] of the Canadian army have reported a reduction in the number of cases of hemolytic streptococcus infection coming from barracks in which oiled sweeping compounds were used, as contrasted with barracks lacking this means of dust control. We have been able to carry the oil preparation of bedclothes to the stage of practical application and hence test on a large scale the effectiveness of this means of reducing the incidence of air-borne infection.[32] Furthermore, the results of our studies on the distribution and control of certain disease agents in the environment have shown that maximum diminution in the number of air-borne pathogens is brought about by means of aerial disinfection combined with measures for effective dust prevention.

SUMMARY

During the past two and one-half years the Commission on Air-Borne Infections, Board for the Investigation and Control of Influenza and Other Epidemic Diseases, Preventive Medicine Service, Office of the Surgeon General, U. S. Army, has been conducting studies on the transmission and control of acute diseases of the respiratory tract in the laboratory and in the field. Before effective measures for control could be devised, it was necessary to acquire much more information concerning the nature of air-borne infection. Investigation of the sources of air-suspended pathogenic bacteria and viruses revealed the fact that environmental contamination by the diseased individual results in secondary reservoirs of infectious material, in bedding and floor dust, from which desiccated secretions are redistributed into the atmosphere in particulate form. Extensive studies of environments containing hemolytic streptococcus patients or carriers have shown that bedmaking and dry sweeping result in a pronounced increase in the numbers of streptococci in the air and probably constitute a more important source of aerial contamination than do "droplet nuclei" expelled directly from the infected person. The finding that hemolytic streptococci may survive for long periods of time (many months) in contaminated blankets added increased significance to the importance of bedclothes as reservoirs of infectious agents. Numerous observations on the relationship of air-borne hemolytic streptococci to the occurrence of streptococcic infection indicated that there was a definite association between the numbers of a given type of hemolytic streptococci present in the air and the incidence of infection with that type.

These findings provided the basis for the institution of certain measures designed to control air-borne infection by (1) preventing the dispersal of infectious material into the air and (2) reducing the infectivity of contaminated atmospheres by killing the disease-producing agents in the air. The first of these measures consisted in oiling the floor and treating the bedclothes with an oil emulsion. Studies of the bacterial population of such treated environments, wards and barracks showed a striking reduction in both the total bacteria and the numbers of hemolytic streptococci present in the air and other parts of the environment. A test of the effect of oiling floors and bedclothes in a large number of army barracks has been instituted and, while not of sufficiently long duration to permit statistical conclusions, the study has yielded data indicating a definitely lowered incidence of acute respiratory infections in soldiers occupying the oiled barracks as compared with the controls. For the further control of aerial contamination, triethylene glycol vapor has been employed. Studies thus far have been limited to hospital wards. It was found that the numbers of hemolytic streptococci in the air of wards housing patients with this type of infection could be largely reduced by the presence in the air of triethylene glycol vapor in bactericidal concentrations. Maximum reduction in air-borne streptococci was observed when oiling of bedclothes and floors was employed in conjunction with the glycol vapor.

30. Krueger, A. P., and others: Laboratory and Field Studies of Glycols and Floor-Oiling in the Control of Air-Borne Bacteria, U. S. Nav. M. Bull. **42**: 1288-1308, 1944.

31. Feasby, W. R., and Bynoe, E. T.: Survey of Hemolytic Streptococcus Infections at Camp Borden, Ontario, 1943: I. Epidemiology, War Med. **5**: 207-215 (April) 1944.

32. After this paper had been sent in for publication we received the May 6 issue of the British Medical Journal, which contained two papers, one describing a new formula for the oil treatment of bedclothes and the other its use in a study of the control of air-borne streptococcic infection in hospital wards: Harwood, F. C.; Penney, J., and Edwards, C. W.: Brit. M. J. **1**: 615, 1944. Wright, J.; Cruickshank, R., and Gunn, W., ibid, p. 611. And on page 616 of the same issue Anderson, P. H. R.; Buchanan, J. A., and MacPortland, J. J., reported a reduction in incidence of acute respiratory disease occurring in barracks with oiled floors.

ABSTRACT OF DISCUSSION

DR. EDWARD BIGG, Chicago: Dr. Robertson and his associates have presented a fundamental basis for an understanding of the problem of the control of cross infections. If it were possible to control the factors of primary source of infection, reintroduction of organisms from secondary reservoirs and to sterilize completely the atmosphere of living groups, one could prevent air borne infection. Since none of these procedures can be effected to the necessary degree, it would appear that a combination of such measures as are available offers the greatest promise in the prevention of infections transmitted by the aerial route. Dr. Robertson has shown clearly the effect of dust control. For the past two years our group at Northwestern has been studying the use of triethylene glycol vapors as a means of air sterilization and its application to the control of air borne disease. During the past winter we had an opportunity to carry out a practical test at a military camp. We have developed apparatus for glycol generation and distribution and were able to maintain bactericidal concentrations of glycol and optimum relative humidity conditions in military barracks. The humidity problem was solved by the use of a vaporizer which introduced water vapor along with the glycol. Studies were made on three groups of 640 men observed for six week intervals and equally divided into test and controls, the former sleeping in glycol treated quarters, the latter in untreated dormitories. A simple overall dust control measure was used, namely the oiling of the floors in both test and control barracks. A reduction in air borne disease of 12 per cent was produced for the entire period, but statistics on the final seventeen days of the period showed a reduction of 64 per cent. Unfortunately a longer test period was not possible, so that more conclusive evidence could not be obtained. The incidence of hemolytic streptococci recovered from throat cultures of men exposed to the effect of glycol vapors fell dramatically in contrast to the control individuals. There was a definite prevention of spread of hemolytic streptococci in the test dormitories and practically complete abolition of these organisms from the air in the glycol treated spaces. More effective dust control measures as outlined by Dr. Robertson used in conjunction with triethylene glycol vapors will bring about a significant reduction in those diseases which now present one of the greatest problems in both civil and military life.

DR. C. H. RAMMELKAMP, Fort Bragg, North Carolina: The fact that respiratory disease may be spread by dust, lint from blankets and similar vehicles needs to be emphasized, since it has been a common teaching that direct contact, contact with

contaminated articles and droplet transmission, are primarily responsible for the spread of respiratory infection. Dr. Robertson's data amply emphasize the importance of dust and blankets in the transmission of streptococcic infection and, in all probability, in the spread of other types of respiratory disease. During the past two and a half years the Commission on Acute Respiratory Diseases, now established at Fort Bragg, North Carolina, has been studying the problem of respiratory disease in the Army. During this period special emphasis has been placed on methods for determining the incidence of infection by the development of clinical and epidemiologic technics as well as by studying etiology. With the exception of outbreaks of influenza, the big problem in respiratory disease in the Army lies in the high incidence of illness of unknown cause. Respiratory disease due to known and recognizable bacteria and viruses accounts for a relatively small proportion of the total cases of illness. Moreover, the incidence of total as well as undifferentiated respiratory disease is much greater in new recruits than in seasoned men, the approximate ratio in these two groups being 10 to 1. It has been repeatedly observed that when new recruits are brought together for the first time under the conditions of army life an epidemic of undifferentiated respiratory disease occurs consistently between the second and fifth weeks of army experience. This pattern of epidemic behavior has been quite constant, although the peak of the epidemic has reached higher levels in the winter than in the summer, in accordance with the known seasonal variation of total respiratory infection.

DR. FRANCIS G. BLAKE, New Haven, Conn.: There are, as Dr. Robertson pointed out, two potential sources of the spread of infection; that is the individual who himself is a dangerous disseminator of respiratory bacterial agents and the environment as represented by contaminated bedclothes and dust. It is highly important to define, if possible, by the experimental approach what is the relative importance of these two factors in the actual spread of epidemic disease. I don't know whether Dr. Robertson plans to approach this problem by having a unit in which the bedclothes and floor are contaminated heavily with hemolytic streptococci, introducing into that unit a group of individuals who are shown not to be carriers of hemolytic streptococci, and a comparable experiment in which the floors and the beds are not contaminated, in which a dangerous human carrier is introduced. Such an experiment might serve to differentiate between the importance of these two possible sources of spread.

DR. TRUMAN S. POTTER, Chicago: The beginning of a line of attack on disease as revolutionary as Dr. Robertson's fully warrants our looking even above and beyond the facts actually in hand. Dr. Robertson has been working chiefly on military diseases and for that reason has been constrained to bypass some of the problems which are of less pressing importance. I have been at the University of Chicago this last winter working in a different laboratory from Dr. Robertson, and I have begun a few brief experiments on the tubercle bacillus. The tubercle bacillus has a much higher lipoid content than most bacteria and consequently it could not be taken a priori that the glycols would be equally effective in penetrating this organism. Also there are certain facts in the epidemiology of tuberculosis which are quite different from those of other diseases. The organism is commonly encased in sputum, and the associated mucus might be expected to protect it, in a measure, from the action of the glycols. Even now it certainly would be premature to speak of the actual significance of the practical prevention of disease, yet I want to say that it has been my privilege in the last winter to do a few brief experiments on the tubercle bacillus which show that this organism also can be killed both in the test tube and in the air with both propylene and triethylene glycol. In some of these experiments the bacilli were atomized into the test chamber containing the glycols, from a suspension of saliva, and were thus coated with a thin film of mucus, as under natural conditions. The result, as determined by the guinea pig inhalation test, was that the bacilli were again exterminated. We have, in the glycols, agents which are broader in their action than the sulfonamides. Although purely preventive and not curative in action, I feel that, in the long run, the glycols may well strike us as having human importance equal to that of the sulfonamides or even greater.

ENURESIS

THE USE OF CYSTOURETHROGRAPHY IN DIAGNOSIS

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AND
SAMUEL A. ROBINS, M.D.
BOSTON

Our primary purpose in this report is to evaluate cystourethrography as a method for investigation of organic uropathy in enuretic patients. The satisfactory presentation of this objective is dependent on a clear conception of the etiology of enuresis. It will therefore be necessary to interpret and clarify the various causative factors which constitute this problem.

Urinary continence is dependent on four factors:

1. An intelligence quotient adequate to appreciate the social necessity and hygienic desirability of controlling the time and place of voiding.

2. Proper and sufficient habit training to condition urination and voluntary control.

3. The patient must be free of specific neurotic and psychotic symptoms and have an emotional status consistent with his age group.

4. A normal voiding mechanism is essential for normal function. In the child, the anatomic and physiologic development must be accordant with the chronologic age.

Urinary continence may be maintained even though one or two of these components are deficient, provided there is a superior compensatory factor. The following illustrates the counteraction of these forces:

A. The mentally deficient: Persons with a very low intelligence quotient may be continent. It is possible to teach the feebleminded person to be dry by inaugurating unusual conditioning reflexes. Similar technics are used in house breaking animals.

B. Inadequate habit training: Many children without formal habit training develop continence. Their acute intelligence and emotional maturity sets up self-conditioning reflexes.

C. Emotional disturbances: An emotionally unstable person may by proper habit training maintain urinary continence. This is accomplished by active deconditioning or antagonistic reconditioning of the psychogenic factors involved.

D. Organic disease: The establishment of continence in an enuretic person does not rule out the presence of an organic lesion. Dryness may be maintained in the presence of pathologic structure and function by exceptional cerebral and emotional control or by suitable habit training.

It is not generally recognized that bed wetting and persistent nocturia in children are related and may replace each other. The former is an involuntary, the latter a voluntary reaction to similar stimuli. Their interchangeability depends on the efficiency of the factors of continence. Many parents disregard this nocturia in children. The blame for frequent voiding during the night is often placed on "overindulgence in fluids," "sleeplessness" or "weak kidneys." It is generally believed that the child will outgrow this condition. Unfortunately, some physicians have a similar attitude.

Read before the Section on Urology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

Lieut. Comdr. Phillip Solomon made it possible to study the enuretic patients from the Habit Clinic for Child Guidance, Douglas A. Thom, M.D., Director.

From the Departments of Urology and Roentgenology, Tufts College Medical School, the Beth Israel Hospital, the Boston Floating Hospital and the Boston Dispensary.

They consider a patient with enuresis as cured when the bed is dry even though he may void in the lavatory two to three times during the night. The same criteria for the cure of enuresis are also found in many reports in the literature.

Enuresis is caused by disturbance of one or more of the factors on which urinary continence is dependent. On this basis enuresis may be divided into four main types:

1. *Intellectual.*—In this group are those enuretic persons whose intelligence quotient is insufficient to acquire new habits. Examples are found in mentally ill and defective children.

2. *Conditioned Reflex.*—In this group enuresis is due to behavior problems and antagonistic habit reactions and is affected by environment, hygiene, social conditions and problem parents.

3. *Psychogenic.*—This group consists of patients with psychoneurosis, psychopathic personalities, emotional disturbances and sexual disturbances.

4. *Organic.*—This group consists of those enuretic persons with organic uropathy.

Combinations of the various types of enuresis occur. In fact, the majority of cases are not of a pure type. Enuresis of one type may agitate another type. The patient with primary organic enuresis often develops secondary emotional disturbances. The patient with a primary sexual disturbance may develop secondary organic changes in the prostate.

The proper classification of enuresis demands the investigation of the four factors of urinary continence. It is beyond the scope of this paper to discuss the first three factors. Their importance and relationship have been merely presented and stressed. More detailed discussions can be found in the psychologic, psychiatric and psychosomatic literature.

Fig. 1 (a boy aged 3).—Normal cystourethrogram with Visco-Rayopake. The bladder and urethra are clearly outlined. The opaque medium is well distributed and mixed with the urine. Note the sharpness of the ovoid area produced by the verumontanum in the posterior urethra between the constriction of the internal and the external sphincters.

The fourth factor, organic disease, plays an important role in the etiology of enuresis. Campbell [1] found uropathy in 60 per cent of 532 persistent enuretic patients whom he investigated. In spite of this unchallengeable finding, some physicians discourage urologic investigation. The following is typical and was published less than two years ago: [2] "Some methods to avoid." 1. "Manipulations or operations for enuresis, such as cystoscopy, tonsillectomy, circumcision and the like. These operations are essentially irrational, except in very rare instances, and often are taken by the patient as being punishment for the enuresis." Such a policy if applied to other symptoms becomes absurd.

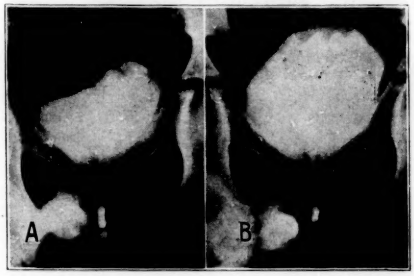

Fig. 2 (S. S., a boy aged 10, enuretic).—The bladder is hypotonic, slightly enlarged and irregular in contour. The base of the bladder is low and pouched. Note the concave defect at the upper border of the bladder (*A*) which is due to incomplete filling. The pressure is produced by the sigmoid and is often associated with improper bowel habits.

The Children's Bureau [3] of the U. S. Department of Labor has made the following recommendation: "If a child as old as 3 years has the habit of wetting the bed, consult the doctor and have him give the child a careful examination." This age is too young and we agree with Campbell that children under 4 years of age seldom require urologic examination solely because of enuresis.

How far shall this examination go to rule out organic disease? Certainly a general physical examination and urine analysis are indicated. The bladder and urethra should be investigated, but cystourethroscopy, which is customarily employed, is not simple and there are many factors which deter its wider use. Endoscopy in children usually requires an anesthetic, and there is reluctance among parents and physicians to submit the child to what they consider a major procedure. The examination necessitates special instruments and an observer with experience in pediatric urology. These facilities are often not available.

Cystourethrography is unhampered by these difficulties and is adequate for the routine investigation of enuretic patients. This is a simple office or dispensary procedure which can be carried out without a general anesthetic. It is safe and relatively free from reaction. The size, shape, position and abnormalities of the bladder and urethra are accurately visualized, and progression or retrogression of lesions can be observed and compared.

INDICATIONS FOR CYSTOGRAPHY AND URETHROGRAPHY IN THE ENURETIC

Enuresis is often empirically labeled as functional, and we believe this practice is contrary to the welfare of the patient. Every case of persistent enuresis should have a cystogram and urethrogram to rule out organic disease. This simple and safe technic should induce a

1. Campbell, M. F.: Enuresis, Arch. Pediat. 54: 187-197, 1937.

2. Levine, M.: Psychotherapy in Medical Practice, New York, Macmillan Company, 1942.

3. The Child from One to Six, Publication 30, United States Department of Labor, Children's Bureau, 1931.

greater number of physicians to submit children with enuresis to urologic investigation.

Opaque Mediums.—It has been our practice to use a 2.5 per cent solution of sodium iodide for cystography and Lipiodol or Iodochlorol for urethrography. The

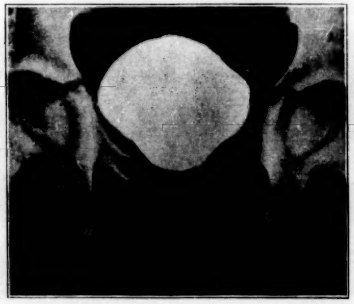

Fig. 3 (R. B., a boy aged 6).—Enuresis since birth. The base of the bladder is pouched, with a wavy outline of the lower and lateral borders. The changes in the bladder are due to a congenital anomaly and edema secondary to infection.

former solution has given satisfactory results, while the latter has many disadvantages.[4]

In recent months we have employed a new substance called Visco-Rayopake, which is superior to the oils for urethrography and cystography. Rubin[5] previously described the properties of this medium and reported its use for hysterosalpingography. Visco-Rayopake contains 3 per cent of a "viscosity base" (a polymeric form of polyvinyl alcohol) and 50 per cent of an opaque organic chemical (2, 4-dioxo-3-iodo-6-methyl tetrahydropyridine acetic acid) rendered soluble by the addition of 17 per cent diethanolamine.

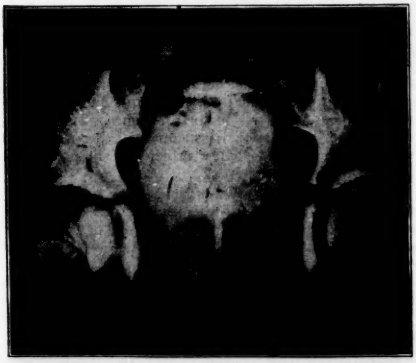

Fig. 4 (W. M., a boy aged 9).—Diurnal and nocturnal enuresis. Large atonic bladder with a tolerance capacity of 350 cc. Neurologic examination was negative. Diagnosis, spina bifida occulta with neuromuscular vesical dysfunction.

We have used Visco-Rayopake in over a hundred and twenty-five examinations with excellent visualization of the bladder and urethra.[6] This medium is well tolerated by children, flows easily and gives a homogeneous shadow with sharp outlines. The opacity can be reduced by diluting the Visco-Rayopake with water. The medium does not break up into globules when mixed with bladder urine (compare figure 1 with figure 9). Instruments and catheters are easily cleansed with warm water following their use. It does not destroy rubber or support bacterial growth. Visco-Rayopake is especially valuable for voiding urethrograms. It can be easily voided in a steady stream and still cast a shadow with sufficient opacity for rapid exposure (fig. 5). Visco-Rayopake will be the subject of a more complete report at a later date.

CYSTOGRAMS

Cystography is considered a useful diagnostic procedure in adults, but its value in children has not been generally recognized. Campbell[7] emphasized its merits

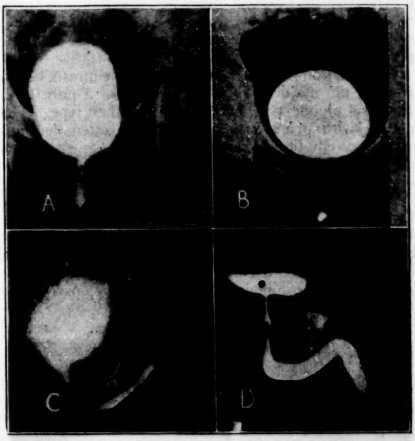

Fig. 5 (R. R., a boy aged 12).—Nocturnal enuresis since birth. *A*, voiding cystourethrogram, anteroposterior view. *B*, cystogram. *C*, voiding cystourethrogram, oblique view. *D*, retrograde urethrogram, oblique view. The bladder outline is round and the edges are serrated by trabeculations (*B*). In the contracting state the bladder elongates vertically and narrows horizontally (*A*) and the detrusor descends, retracting the posterior lip of the vesical neck (*C*).

when he wrote "properly interpreted, these changes in the vesical outline are frequently sufficient to establish the correct diagnosis without further instrumentation." We have followed his cystographic technic.[8] The ease of execution and the informative potentiality make cystography especially useful in the enuretic.

The position of the child's bladder is central and well above the upper border of the symphysis. The normal bladder in the child is elliptic (fig. 1) or spherical when completely filled. When incompletely filled it appears flattened on the top (fig. 2 *A*). In the oblique view the cystogram appears elongated in the horizontal diameter. Normally the cystographic outline is smooth. In the presence of chronic infection and obstruction the borders are irregular and the bladder wall is thickened (fig. 11).

4. Hyams, J. A.; Kenyon, H. R., and Kramer, S. E.: Urethrocystography in the Male, J. A. M. A. **101**: 2030-2035 (Dec. 23) 1933.
5. Rubin, I. C.: A New Soluble Viscous Contrast Medium for Hysterosalpingography, J. Mount Sinai Hosp. **7**: 479-485, 1941.
6. The contrast substance for this study was supplied by Hoffmann-LaRoche, Inc., Nutley, N. J.
7. Campbell, M. F.: Pediatric Urology, New York, Macmillan Company, 1937, vol. 1, p. 65.
8. Campbell, M. F.: Cystography in Infancy and Childhood, Am. J. Dis. Child. **39**: 386-402 (Feb.) 1930.

The appearance of sacculations or diverticula is similar to those in the adult bladder.

Increased bladder capacity is a common finding in the enuretic. The atonicity is due to decompensation of the bladder musculature secondary to urethral obstruction or to defective nervous conduction, which causes sympathetic imbalance or diminished sensation to distention (somatic disturbances). The cystogram reveals an immense bladder shadow which is smooth and regular in outline and fills the entire pelvis (fig. 4). A dilated bladder is of especial importance in spina bifida occulta. Bohart [9] found 161 cases of spina bifida occulta in 931 symptomless spines, indicating that it is not a disease in itself but a normal deviation of the spinal column. The condition is of clinical importance only if it is associated with changes in the roots from the sacrolumbar cord. A cystogram and urethrogram will determine whether there is any vesical involvement.

Diminished bladder capacity (hypertonicity) is due to vesical and urethral inflammation or to parasympathetic imbalance. The bladder shadow is small and irregular

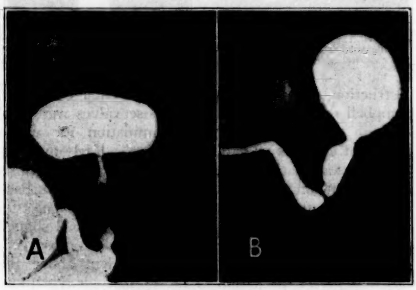

Fig. 6 (R. L., a boy aged 4½).—*A*, retrograde urethrogram. *B*, voiding urethrogram. Enuresis since birth. There is a constriction of the bulbous urethra, constriction of the vesical neck and collicular edema. Note the proximal dilatation of the prostatic urethra (*B*) and the distal distention of the penile urethra (*A*).

in outline. Cystography in these irritable bladders may be unsatisfactory because of a rapid expulsion of the medium even when a small amount is used. We have observed severe bladder spasm and leakage around the catheter after the injection of less than 50 cc.

Normally the bladder base is curved, with the convexity downward. Vesical neck hypertrophy or prostatic enlargement may protrude into the bladder and distort the base, so that there is a concavity downward (fig. 7). Pouching is sometimes observed at the base, resembling a small cystocele (fig. 3). The vesical oulet is not seen on the cystogram, but if the internal sphincter is paralyzed the opaque medium leaks into the posterior urethra, giving the appearance of a smooth funnel.

Ureteral reflux is not often observed in enuretic patients but, when present, indicates definite pathologic change. In these cases studies of the upper urinary tract are indicated.

URETHROGRAMS

Urethrography in children has been neglected. A careful search of the urologic and roentgenologic literature did not reveal a single report which completely covered this subject. The interpretation of urethrograms in children is too extensive for this paper and will be presented at a later date. However, sufficient description and explanation is introduced to appraise the value of the procedure in the enuretic. Correct interpretation of urethrograms requires correlation with cystoscopic, operative and postmortem findings. When sufficient

Fig. 7 (B. G., a boy aged 5).—Enuresis since birth. Note the elevation of the bladder base, the spasticity of the external sphincter and the enlarged, rounded, collicular shadow bifurcating the urethra.

experience has been gained, urethrography will be found as valuable for the study of lower urinary tract disease as pyelography is for the diagnosis of renal pathologic conditions. The technic of urethrography and a specially designed instrument to facilitate this procedure have been previously reported by one of us.[10]

Urethral Obstruction.—Urethrography is especially valuable to demonstrate strictures of the anterior urethra in children. The small caliber of the canal makes routine urethroscopy difficult and unsatisfactory. On the urethrogram the constriction appears as a narrowing in the continuity of the canal. The secondary changes are also dramatically pictured. On the voiding

Fig. 8 (R. M., a boy aged 6).—Diurnal and nocturnal enuresis. Patient has spina bifida occulta. Urethrogram reveals multiple organic lesions. There are two strictures in the glandular urethra. One is acquired and is at the meatus. The other is a congenital narrowing in the region of the fossa navicularis. Both the internal and the external sphincters are relaxed. The verumontanum is absent.

urethrogram a ballooning of the canal is observed proximal to the stricture, visualizing the distention and stasis caused by the obstruction. On the retrograde urethro-

9. Bohart, W. H.: Year Book of General Surgery, 1929, pp. 711-712.

10. Brodny, M. L.: A New Instrument for Urethrography in the Male, J. Urol. 46: 350-354, 1941.

gram the stricture impedes the flow of the injected medium and may produce mechanical distention distal to the obstruction (fig. 6).

Stenosis of the glandular urethra is a common finding in the enuretic. Stockwell and Smith [11] found an incidence of 23 per cent and Winsbury-White [12] 27 per cent. The constriction is of two types on the urethrogram: one type is of the pinpoint variety and is a simple cylindric stricture of the lips of the meatus. It is due to scarification secondary to a meatitis and is most common in the circumcised patient. The other type is a uniform narrowing extending from the meatus through the entire portion of the glandular urethra and is congenital in origin (fig. 8). Occasionally the stenosis is so tight that filiform dilation is necessary before a catheter can be passed. On the voiding urethrogram, narrowing of the stream at the stricture can be observed.

Local congenital malformations and acquired obstructions of the vesical outlet are types of deformities too often unrecognized in enuretic children. Hypertrophy of the internal sphincter (fig. 9), contracture of the vesical neck (fig. 6), median bar and congenital valves can be diagnosed by urethrography. These lesions disturb the architecture of the posterior urethra in relation to the bladder base. In hypertrophy of the internal sphincter the supracollicular portion of the urethra is elongated and compressed, forming a collar-like structure which by projecting into the bladder concaves the outline of the base. In contracture of the vesical neck the region of the internal sphincter is shortened and

Fig. 9 (D. L., a youth aged 18).—Urethrogram with 28 per cent lipiodol. Enuresis since birth. Arrow points to large cyst at the verumontanum. The vesical neck is elongated and tight and the external sphincter spastic. Enuresis was cured by endoscopic fulguration and urethral dilation.

constricted and the bladder base is flattened. On the voiding urethrogram the supracollicular portion of the urethra fails to dilate, owing to the rigidity of the vesical neck. Median bar hypertrophy is best recognized in the oblique views and appears as a notching and elevation of the posterior lip at the urethrovesical junction.

Congenital valves of the posterior urethra occur in enuretic patients. The symptoms are usually those of

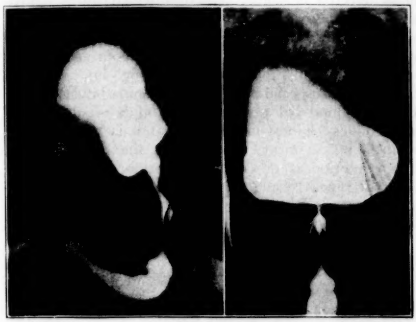

Fig. 10 (H. M., a boy aged 9).—The base of the bladder is flattened and the vesical neck is constricted. The collicular shadow is bifurcated. The external sphincter is spastic and there is a meatal stenosis.

obstruction, but enuresis may be the chief complaint. Campbell operated "on 9 boys whose valves were discovered during a urological examination for which persistent enuresis was the indication." Early urethrographic examination is essential, since the prognosis is dependent on the removal of obstruction before back pressure has produced irreversible renal damage. On the urethrogram a typical supracollicular funnel shaped dilatation and bifurcation of the canal is observed. The effects of back pressure are evident above the obstruction. A discussion of the cystoscopic, postmortem and urethrographic findings in congenital valves has been previously reported by one of us.[13]

Abnormalities of the verumontanum occur in children and may often cause enuresis. Hypertrophy of the verumontanum may be congenital in origin and cause symptoms of obstruction. A congestive type of enlargement is seen in chronic masturbators. Verumontanitis due to infection is more apt to occur in the older enuretic patients and is associated with prostatitis (fig. 7). The normal verumontanum projects into the lumen of the posterior urethra and appears in the contrast shadow as an elliptic area of diminished density (fig. 1). With disease, this collicullar defect is two to three times normal in size, it is round or pyriform, and the outline is irregular (fig. 10). Polyps, cysts (fig. 9) and edema cause characteristic distortions of the shadow. Occasionally the verumontanum is absent on the urethrogram (fig. 8). This may be a congenital anomaly or due to hormonal deficiency. These patients should be examined from an endocrinologic point of view.

Infections.—Chronic and congestive prostatitis is recognized by characteristic changes in the posterior urethra (fig. 12). On the retrograde urethrogram there can be noted compression and narrowing of the canal, enlargement of the verumontanum and elevation of the bladder base. In the presence of urethritis the outline of the anterior urethra is wavy, the channel is

11. Stockwell, A. L., and Smith, C. K.: Enuresis, Am. J. Dis. Child. **59**: 1013-1033 (May) 1940.
12. Winsbury-White, H. P.: A Study of Three Hundred and Ten Cases of Enuresis Treated by Urethral Dilation, Brit. J. Urol. **13**: 149-162, 1941.
13. Derow, H. A., and Brodny, M. L.: Congenital Posterior Urethral Valve Causing Renal Rickets, New England J. Med. **221**: 685-690, 1939.

narrower than normal and the external sphincter may be spastic. On the voiding urethrogram there is noted rigidity of the lumen of the posterior urethra.

Neuromuscular Dysfunction.—Enuresis is often associated with imbalance of the detrusor and sphincteric musculature of the bladder. The etiology of this dysfunction is diagnosed by correlation with concomitant neurologic signs and symptoms. However, in many enuretic patients the disturbances of vesical innervation are the only evidence of a neuromuscular disease. Therefore normal neurologic findings in a child do not eliminate the possibility of neuromuscular uropathy.

The vesical dysfunction results from either congenital or acquired lesions of the spinal cord or peripheral nerves. Roentgenologic examination can disclose which muscular elements of the bladder or urethra are involved and whether they are spastic or paretic. The secondary changes due to infection and back pressure can also be observed.

The urethrogram visualizes the state and tone of the vesical sphincters. A spastic internal sphincter causes an hour glass deformity between the urethra and the bladder (fig. 10). An atonic internal sphincter appears as a funnel shape dilatation of the supracollicular urethra. When both sphincters are atonic, the normal constrictions at the vesical neck and membranous urethra dilate and the prostatic canal appears as an undifferentiated tube (fig. 8).

CONCLUSIONS

1. The intellectual, the conditioning, the psychogenic and the physical factors should be investigated in every patient with persistent enuresis over 4 years of age. Several etiologic factors may coexist.

Fig. 11 (I. F., a boy aged 10).—Diurnal enuresis. The outline is wavy and scalloped, because of trabeculations. The verumontanum is enlarged and edematous. The vesical neck is constricted.

2. The conversion of enuresis to nocturia does not constitute a cure.

3. A general physical and urologic examination is necessary for the diagnosis of organic uropathy in enuretic persons.

4. Cystourethrography should be part of this routine urologic examination.

5. Visco-Rayopake is a superior contrast medium for cystourethrography.

6. Cystourethrography provides a graphic record of pathologic structure and function of the bladder and urethra.

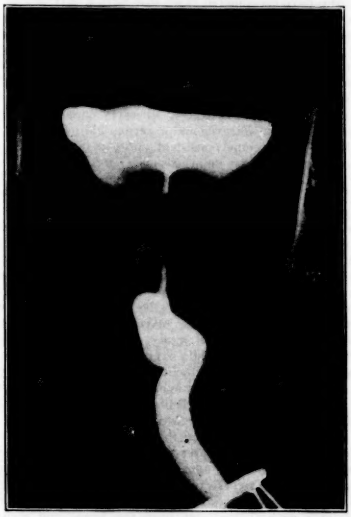

Fig. 12 (J. B., a boy aged 16).—Intermittent enuresis; chronic masturbater for four years. The prostate was large and boggy. The lateral lobes projected into the bladder and compressed the prostatic urethra. The verumontanum was elongated. The external sphincter was spastic.

7. This simple and safe procedure should induce a greater number of physicians and parents to submit enuretic patients to urologic investigation.

ABSTRACT OF DISCUSSION

DR. GEORGE H. EWELL, Madison, Wis.: The paper presents a study of many points about the anatomy and physiology of children's bladders about which I was little aware. It calls attention to the fact that there are many different causes of enuresis and that local causes are responsible in the vast majority of them. I believed that enuresis was a behavior problem and that whenever you were consulted by one of these patients you promptly sent him back to the pediatrician, provided, of course, that the urine did not show gross evidence of infection or x-ray examinations did not show those common and gross conditions such as stones, hydronephrosis or other congenital abnormalities. The authors are describing children. I have done cystoscopies on a fair number of children with enuresis, both boys and girls. The majority of the cystoscopies that I have made have been on girls, because they are more readily examined. The vast majority of cases of enuresis in girls I have found to be due to inflammatory changes about the bladder neck and in the urethra. I am a believer in Folsom's studies and I approach the subject in the female from that point of view. I know that some of these cases are due to metabolic disturbances, and we certainly know that feebleminded children have enuresis. I have treated feebleminded patients with enuresis and have relieved them. I believe that if Brodny and his associates and others will continue urologic investigation of cases of enuresis they will put the problem back where it belongs —in the hands of the urologist and not in the hands of the pediatricians or the so-called child guidance clinics.

LIEUTENANT COLONEL DORRIN F. RUDNICK, M. C., U. S. Army: In the Army we do not feel that enuresis is necessarily a habit. It is far more frequently a symptom of an underlying physical or mental condition. We are able to classify most cases in the following groups: (1) organic disease, (2) psychoneurosis, (3) lack of proper training and (4) malingering. We have encountered cases that were a part of a systemic disease such as diabetes insipidus, hyperthyroidism and hyporetropituitarism. These represented a very small percentage and were controlled by treatment directed at the underlying condition. We were especially pleased with the improvement of 1 case under therapy with posterior pituitary injection. Organic lesions of the genitourinary tract have not been encountered as frequently as one would expect. In every case cystoscopy was carefully done and intravenous or retrograde pyelograms made. The lesion that we found consistently present, if any in the genitourinary tract, was an enlarged and sensitive verumontanum. This most frequently was found with a history of masturbation or chronic withdrawal. We feel that masturbation is elaborately indulged in. Whether the edematous, sensitive verumontanum is directly the result of masturbation or withdrawal or not, we are able to say that cauterization has produced a clearing up of the local situation and with its improvement a disappearance of the enuresis. Phimosis of varying degree of severity was encountered, but circumcision failed to improve a single case in our series. Excessive acidity of the urine was not frequently found, and its correction was not followed by benefit. Limitation of fluid intake, abolition of fatiguing and exciting factors, position while sleeping and hospitalization have all been repeatedly tried without benefit. Dr. Rose suggested the central character of the stimulation and that it was initiated by a stimulus that resulted when urine arrived in the posterior urethra. This led to his suggestion of the application of perineal pressure. We have tried this in 1 case with good results. However, removal of the pressure after a few nights was followed by recurrence, so apparently a much longer period of reeducation or habit correction will be necessary. Malingering has accounted for a certain number of cases. Incurable enuresis results in a medical discharge from the Army, and each such discharge is usually followed by a series of other cases making their appearance at the clinic in the hopes of likewise getting out. These cases are not too difficult of segregation, however, and firm measures usually result in a rapid and thorough "drying up." The relationship of psychoneurotic and personality defect factors to enuresis is an all important one. Sixty-five per cent of the cases I have seen fall into this group. The cases practically always present a personality problem, unusual shyness or sensitivity, sexual repression or emotional instability. Infantile regression is a terrific problem in the Army, making its appearance in many different forms. The fainting, crying spells and refusal to eat manifested in so many cases is probably a comparable process to enuresis in these young men with personality defect complexes. The stress and strain of adjustment to the Army undoubtedly activates these processes. Adult enuresis is a problem chiefly for the neuropsychiatrist.

DR. REX VAN DUZEN, Dallas, Texas: I prefer cystoscopy to cystourethrograms. The latter have been inconstant in my hands. I feel that the usual cystoscopy is made too casually. A few years ago it was suggested that enuresis was a problem only for the pediatrician. The experiences of the armed forces has brought it forcibly to our attention that many adults are "bed wetters." I have recently seen a lady of wealth, aged 55, who has been partially incontinent throughout life because she had been told that nothing could be done. Because many feeble-minded patients are bed wetters, the public has often associated bed wetting with low mentality. This has caused many to conceal the affliction for fear of the added stigma. We have all heard the statements that it would cease at puberty or when sexual relations were experienced. Some cases were cured at puberty or after marriage and were the basis for these conclusions. I am speaking of the persons who asked to consult you after office hours or behind carefully closed doors, the patient who feels it is a disgraceful condition or the one who is threatened with divorce. The recent suggestion of the use of ephedrine sulfate and methyl testosterone should be stressed. Ephedrine sulfate produces an apathy, and the usual stimuli from the bladder fail to produce the normal reflex action and usually allow the bladder to hold the urine secreted during the night. Many boys have been cured by methyl testosterone. I believe its action is due to engorgement of erectile tissue about the urethra. However, one patient who was decidedly improved by ephedrine sulfate became totally incontinent when methyl testosterone was given and he was very slow to respond to ephedrine when it was resumed. In 1935 I resected the presacral nerve for enuresis, with complete and permanent cure. This has been duplicated in other cases. Presacral neurectomy produces a paralysis of the trigone muscle and these patients have to strain to start the act of urination. This has been sufficient to awaken the patient.

DR. GRAYSON L. CARROLL, St. Louis: The question of enuresis was placed on the program as a result of conversation with medical officers who are in army camps. I was amazed to discover the large amount of enuresis found in these camps. I thought that it was high time that we were finding out something about it, and we as urologists are charged with the responsibility. I found considerable difficulty in having some one write on the subject and to find discussers, because they all frankly admitted that they didn't know enough about it. The contribution of Drs. Brodny and Robins was a splendid one, and I think that out of this discussion will come some constructive ideas.

DR. MEREDITH F. CAMPBELL, New York: We are all agreed that enuresis is a functional condition in at least 95 per cent of the cases. Yet it has been my observation in the study of over 1,500 enuretic children subjected to urologic examination because intensive medical treatment had been ineffectual that organic urologic disease existed in 50 to 60 per cent. The disease is treated on the basis of the demonstrated uropathologic condition. Cystourethrograms effectively illustrate the desirability of carrying out complete urologic examination of enuretic individuals, particularly children, whom three or four months of intensive medical therapy, psychotherapy, gold stars, alarm clocks and atropine fails to cure of enuresis. A physician's son aged 8 years acquired gonorrhea at the age of 2. He had been casually examined by several pediatricians and by eminent urologists. He was said to suffer only a functional condition to be outgrown, but none of these clinicians took the trouble to investigate adequately the boy urologically. A urethrogram beautifully demonstrated the filiform caliber gonorrheal stricture of the bulbous urethra. Simple periodic progressive dilation of the stricture with steel sounds not only cured the enuresis but forestalled subsequent severe back pressure damage of the kidneys. Many cases of so-called enuresis will be found on adequate examination to be organic urologic disease. Here the enuresis is merely a symptom, and eradication of the organic disease almost always causes the bed wetting to cease.

DR. M. LEOPOLD BRODNY, Boston: We deliberately refrained from discussing the treatment of enuresis because our subject is primarily a diagnostic problem. A point we wish to emphasize is that the study of an enuretic person demands team work. Our organization is composed of a pediatric psychiatrist, a roentgenologist, a pediatrician and a urologist. We study these patients from four angles—the four factors of continence. Only in this manner can the patient be satisfactorily treated, because enuretic persons with organic lesions may also have pronounced emotional disturbances. Consequently the patient may retain his symptom if only the organic condition is corrected. The enuresis remains on a functional basis. As for diabetes, Dr. Joslin informed me that his incidence of enuresis is no greater in the diabetic than it is in the normal child. One of our members inquired about the opaque medium we are using. It is an organic iodide in polyvinyl alcohol and was prepared by Hoffmann-La Roche. It is not yet available for distribution. Rubin has previously reported the substance for use in hysterosalpingography. It has a viscosity very similar to Lipiodol and can be diluted by the addition of water. This characteristic is very valuable for use in children because the viscosity and opacity can be controlled without the use of special oils. It takes a little experience and effort to be able to read urethrograms. However, after a period of cystoscopic correlation abnormalities are recognized, and the lesions can be diagnosed directly from the roentgenograms. Some of the lesions observed on the urethrogram cannot be detected by cystoscopy.

THE EFFECT OF PARA-AMINOHIPPURIC ACID ON PLASMA CONCENTRATION OF PENICILLIN IN MAN

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AND
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Since the original announcement by Beyer, Peters, Woodward, Verwey and Mattis[1] three reports have been submitted for publication or appear in the literature to the effect that when sodium para-aminohippurate and penicillin were administered simultaneously the former compound competed with penicillin for the same renal tubular excretory mechanism. By doing so the rate of renal elimination of penicillin was much reduced, thereby slowing considerably the rate of fall of the plasma concentration of the antibiotic agent.[2] It was shown further that, in experiments wherein penicillin was administered continuously at a given rate for as long as forty-eight to fifty-four hours, raising or lowering the plasma concentration of para-aminohippuric acid similarly administered produced a concomitant elevation or fall of the plasma concentration of penicillin. A combination of these agents was administered continuously by venoclysis for forty-eight hours to dogs without producing functional or histomorphologic changes attributable to the two agents.[3] Finally, it was shown that the acute toxicity of sodium para-aminohippurate was very low, being less than for sodium hippurate, a metabolite.[4]

In view of the widespread interest in this research and the implications of the possible therapeutic efficacy of the combination, it was decided to obtain data on a few patients to determine whether the simultaneous administration of para-aminohippuric acid with penicillin did produce an elevated plasma concentration of the antibiotic agent. Such a program would also permit us to study the patients carefully for any untoward reactions to the therapy so that we might be able to call these effects to the attention of other investigators.

METHODS

Penicillin was administered continuously by venoclysis at a constant unitage and rate over a period of thirty hours. At the onset the patients were given a priming intravenous dose of 10,000 units of penicillin sodium and were then connected immediately to the "drip" infusion outfit. At the end of six hours the infusion solution was changed from penicillin in 5 per cent glucose to penicillin in 6 per cent sodium para-aminohippurate. At that time the tube was clamped and 50 cc. of 6 per cent para-aminohippuric acid was injected intravenously through the rubber tubing just above the needle adapter. This usually was injected over a period of ten minutes. The tube was then unclamped and the infusion was adjusted to the previous rate. Penicillin in para-aminohippuric acid was administered over a period of twelve hours, at the end of which time the infusion solution was changed back to penicillin in 5 per cent glucose for the remaining twelve hours of the experiment. Thus there were three phases to the test: an initial control (six hour) phase wherein penicillin was administered in glucose solution, a second (twelve hour) phase wherein penicillin was administered in a 6 per cent solution of sodium para-aminohippurate, and a third or control (twelve hour) phase during which penicillin was administered again in glucose solution.

A blood sample was taken at the beginning of the test for control hematologic tests, at four and six hours in the first phase of the experiment, at six and twelve hours in the para-aminohippuric acid phase and at six and twelve hours in the third period. The patients and the physical equipment were observed continuously by one or the other of the first two authors during the thirty-hour periods.

The penicillin plasma assays were performed by a modification of the Rammelkamp method.[5] In the assays on the first 5 patients horse erythrocytes were used as the test object. Since human plasma contains lysins for horse erythrocytes, assays on plasma from the first 5 patients were complicated in the lower dilutions by spontaneous lysis. However, penicillin end points were determined satisfactorily by the microscopic demonstration of streptococcus multiplication. Human erythrocytes were employed quite satisfactorily in the assays on the last 4 subjects. The method for the determination of para-aminohippuric acid in body fluids was simply a modification of the conventional Bratton and Marshall procedure for sulfonamides and has been described in detail elsewhere.[6]

Patients were selected at random without regard to age, sex, severity of illness or diagnosis, except that it seemed best not to complicate the results by using any patient with primarily a renal disease. While the condition of the patients was carefully followed, we shall not attempt to evaluate the experiments in terms of therapeutic results.

RESULTS

The information and the results of the tests on 9 patients are summarized in the accompanying table. From these data other information may be calculated. Examination of the table reveals that in every instance the administration of para-aminohippuric acid with penicillin caused at least a twofold increase in plasma concentration of the antibiotic agent. Para-aminohippuric acid was effective in producing this elevation at its lowest plasma concentration which obtained in the experiments (7.9 mg. per hundred cubic centimeters) but the greatest (over fivefold) accentuation of penicillin plasma concentration was in the case having the highest para-aminohippuric acid plasma concentration (47.7 to 46.9 mg. per cubic centimeter). Thus there was a definite relationship between the plasma concen-

From the University of Pennsylvania Hospital, Philadelphia, and the Departments of Pharmacology and Bacteriology, the Medical-Research Division, Sharp and Dohme, Inc., Glenolden, Pa.

1. Beyer, K. H.; Woodward, R.; Peters, L.; Verwey, W. F., and Mattis, P. A.: The Prolongation of Penicillin Retention in the Body by Means of Para-Aminohippuric Acid, Science **100**: 107-108 (Aug. 4) 1944.

2. Beyer, K. H.; Peters, L.; Woodward, R., and Verwey, W. F.: The Enhancement of the Physiological Economy of Penicillin in Dogs by the Simultaneous Administration of Para-Aminohippuric Acid: II, J. Pharmacol. & Exper. Therap., to be published.

3. Beyer, K. H.; Verwey, W. F.; Woodward, R.; Peters, L., and Mattis, P. A.: The Enhancement of the Plasma Concentration of Penicillin in Dogs by the Simultaneous Administration of Para-Aminohippuric Acid: III, Am. J. M. Sc., to be published.

4. Mattis, P. A.; Beyer, K. H.; McKinney, S. M.; Patch, E. A., and Russo, H. F.: Pharmacologic and Toxicologic Studies on Para-Aminohippuric Acid, to be submitted for publication.

5. Rammelkamp, C. H.: A Method for Determining the Concentration of Penicillin in Body Fluids and Exudates, Proc. Soc. Exper. Biol. & Med. **51**: 95 (Oct.) 1942. Beyer, Peters, Woodward and Verwey.[2]

6. Goldring, W., and Chasis, H.: Hypertension and Hypertensive Disease, 1944, New York, Commonwealth Fund, pp. 203-204.

tration of para-aminohippuric acid within this range and the amount to which the penicillin level was elevated. A rate of infusion of about 80 mg. per kilogram per hour appeared to be adequate to maintain a para-aminohippuric acid plasma concentration of 10 mg. per hundred cubic centimeters or over when normal renal function was present.

A combination of circumstances tended to make the basal penicillin plasma concentration of the last 4 patients considerably higher than was anticipated from the earlier experiments in the first 5. These were the greater basal concentrations of penicillin contained in the solutions administered to patients of lighter weight, and certain differences in handling the plasma. However, there can be no doubt as to the quantitative changes within each test reflecting the effect of para-aminohippuric acid administered.

mized. The second patient who received the same amount of para-aminohippuric solution at a rate of injection of 5 cc. per minute also defecated within a few minutes after the injection.

After this experience of intestinal and bladder smooth muscle response to the injection it was decided to warm the solutions for the priming doses to body temperature before their administration and to inject the material over a period of ten minutes (5 cc. per minute). After the initiation of this procedure there was only 1 patient (E. R.) who had a bowel movement immediately after the injection of para-aminohippuric acid. This patient also had a sensation of warmth during the injection, which promptly subsided following instigation of the penicillin-para-aminohippuric acid "drip." This was the only patient who had any subjective reaction to the injection. In several instances the change to para-

A Summary of Data Demonstrating the Effect of the Simultaneous Administration of Sodium Para-Aminohippurate (PAH) in Producing an Elevation of the Penicillin Plasma Concentration of Patients

Patient*		W. E.	J. J.	A. W.	S. P.	J. C.	P. D.	B. C.	A. A.	E. R.
1st control phase penicillin, u/cc	4 hr.	0.00	0.041	0 00	0.00	0.02	0.16	0.16	0.16	0.12
	6 hr.	0.00	0.041	0.00	0.00	0.02	0.16	0.16	0.12	0.04
PAH phase penicillin, u/cc	6 hr.	0.083	0.124	0.00	0.00	0.002	0.328	0.494	0.328	0.654
	12 hr.	0.042	0.124	0.041	0.041	0.041	0.474	0.628	0.332	0.663
2d control phase penicillin, u/cc	6 hr.	0.00	0.041	0.00	0.00	0.02	0.082	0.332	0.168	0.164
	12 hr.	0.00	0.041	0.020	0.020	0.00	0.082	0.083	0.165	0.244
PAH concentration, mg./100 cc. plasma	6 hr.	17.0	9.1	10.1	44 9	20.5	26.7	42.0	29.0	47.7
	12 hr.	9.8	7.9	11.0	15.0	22.2	17.4	46.4	31.9	46.9
	18 hr.	...	...	....	....	....	0.2	1.2	0.8	0.4
PAH infusion, Gm./Kg./hr.		0.073	0.185	0.095	0.128	0.097	0.148	0.168	0.137	0.155
Penicillin infusion, u/Kg./hr.		42.0	63.0	55.5	74.5	56.5	172.0	188.0	159.0	183.0
Rate of infusion, cc./min.		1.4	2.05	1.6	2.08	2.10	1.8	2.2	1.7	1.9
Weight of patient, Kg.		73.3	70.2	62.8	66.6	81.0	43.2	50.0	43.7	43.2
Age, years		58	37	35	32	41	14	09	38	53
Sex		♂	♂	♂	♂	♂	♂	♂	♀	♀
Race		White	Negro	Negro	White	White	Negro	White	White	Negro

* Diagnosis: W. E., atypical pneumonia; J. J., asthma; A. W., tuberculous peritonitis; S. P., Hodgkin's disease, onset January 1944; J. C., acute pharyngitis, bronchopneumonia; P. D., infectious mononucleosis; B. C., periostitis of femur; A. A., asthma; E. R., lobar pneumonia.

There was no outstanding difference in response due to age, sex or race. It was not possible in so small a number of patients to note any difference in penicillin response to para-aminohippuric acid attributable to the nature or severity of the diseases, though these two factors varied widely in this series.

Pharmacodynamic Effects of Sodium Para-Aminohippurate.—These should more properly be considered in two categories: (1) those effects attending the injection of the priming doses and (2)) those occurring during or following the para-aminohippuric acid infusions.

The purpose of the initial intravenous administration of 50 cc. of 6 per cent para-aminohippuric acid was to saturate the patients quickly and to attain satisfactory plasma concentrations which might be maintained by the subsequent infusions. The administration of the 50 cc. volume of material over a period of five minutes to the first patient was followed immediately by defecation and micturition but was attended by no noticeable subjective manifestations. Since none of the patients appreciated that they were receiving anything besides solutions of penicillin, the psychic element in the subjective response to para-aminohippuric acid was minimized. aminohippuric acid, including the priming dose, was made at night during the patients' natural sleep without their knowledge of the procedure.

There was no instance of an objective or subjective reaction to the combined penicillin and sodium para-aminohippuric infusion either during or for several days following the twelve hour infusions other than what has been described to occur in certain instances following the initial intravenous injections. How much of this smooth muscle response following the priming dose was due to a reflex response initiated by the local cooling of the vein for five to ten minutes and how much could be ascribed definitely to para-aminohippuric acid was not certain. However, the sign which has been described was neither serious nor disagreeable. The combination of penicillin and para-aminohippuric acid therapy cannot be said to have influenced deleteriously the physical condition, the blood picture or the illness of any of the patients.

The patients were permitted to continue their regular therapy, to eat their customary hospital diet and to drink water or fruit juice whenever they liked. It should be pointed out that no source of electrolyte other than the para-aminohippuric acid, which has been

adjusted with sodium hydroxide to p_H 7.0, was used in the infusion solutions and no edema was noted in any of the patients.

COMMENT

The results of this research are presented herein simply to demonstrate that in man the intravenous administration of sodium para-aminohippurate is capable of elevating several-fold the plasma concentration of penicillin over that which obtains when the latter agent is administered by venoclysis in glucose solution. This was in effect a confirmation in the human being of what has already been found to obtain in dogs. For this purpose only a small number of patients was deemed necessary.

It was found that only when para-aminohippuric acid was administered rapidly at room temperature was there noted any objective or subjective reaction to the drug. The only noteworthy untoward effect occurred following the administration of certain of the priming doses of para-aminohippuric acid, and this was a contraction of the smooth musculature of the large intestine and bladder, unattended by pain or discomfort. The infusion of para-aminohippuric acid and penicillin continuously for twelve hours produced no discernible deleterious effects on the patients who manifested a number of unrelated disease entities.

It would appear from this and previous animal experimentation that, if attention is given to rate of fluid administration and electrolyte balance, one should anticipate no serious consequences to the administration of penicillin in such a solution of sodium para-aminohippurate over a much more extended period of time. It seems reasonable at this stage of our knowledge to suggest that the plasma concentration of para-aminohippuric acid be checked fairly frequently to make sure that the function of kidneys known to be diseased is sufficient to allow excretion of the drug rapidly enough to prevent the blood level of para-aminohippuric acid from becoming excessive. It is probable that should such a circumstance be found to occur the effectiveness of this combination might be greater than ordinarily would be expected at lower plasma concentrations of para-aminohippuric acid than those used in this work. In making this final suggestion we have in mind the observations of Rammelkamp and Keefer [7] that more effective plasma concentrations of penicillin were found to be present in patients who had known renal involvement. This can be interpreted in the light of recent work [8] as probably being due to renal damage wherein there exists a decreased transport capacity of the tubular excretory mechanism.

CONCLUSIONS

In human beings, as in dogs, one can either effect a considerable economy of penicillin or maintain plasma concentrations of the antibiotic agent not heretofore practicable when penicillin together with sodium para-aminohippurate is administered continuously by venoclysis. Very few secondary effects have been observed to attend the combined use of these compounds in this study.

7. Rammelkamp, E. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, J. Clin. Investigation **22**: 425 (May) 1943.

8. Earle, D. P.; Taggart, J. V., and Shannon, J. A.: Glomerulonephritis: A Survey of the Functional Organization of the Kidney in Various Stages of Diffuse Glomerulonephritis, J. Clin. Investigation **23**: 119-137 (Jan.) 1944. Smith, H. W.; Finkelstein, N., and Aliminosa, L.: The Renal Clearances of Substituted Hippuric Acid Derivatives and Other Aromatic Acids in Dog and Man, to be submitted for publication. Goldring and Chasis.[6]

THE MEDICAL MANAGEMENT OF ULCERATIVE COLITIS

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There are many different types of ulcerative colitis. All forms of ulcerative colitis assume in their very nature the status of chronic disease. Hence the term "chronic ulcerative colitis" is best used to denote general clinicopathologic syndromes rather than to designate one of the several specific disease entities in which these syndromes are present. In medical practice it becomes necessary to study chronic ulcerative colitis according to etiologic types, and the first and most fundamental clinical effort should be directed at determining the specific etiologic factor responsible for the development of the syndrome in a given case. The infection may be caused by one or more of several bacteria or animal parasites, in association with certain dietary and constitutional deficiencies, or by other conditions, some of them still unknown.

STREPTOCOCCIC ULCERATIVE COLITIS

The most common condition of the group involving primarily the large intestine is that commonly referred to as "nonspecific" or "idiopathic" ulcerative colitis. If physicians using the term would apply it to a single disease entity, well and good, but unfortunately a variety of ulcerative intestinal conditions are included under this designation. In fact, some writers include under it all cases of ulcerative colitis which are not of amebic or tuberculous origin. Consequently the term becomes no longer tenable. The terms "colitis gravis" and "thrombo-ulcerative colitis" are descriptive of the serious nature of the disease and its pathologic inception and go far in depicting a disease entity. However, since in this paper I shall aim to give definite status to each form of ulcerative colitis I shall refer to this type as streptococcic ulcerative colitis.

This disease has characteristic pathologic manifestations and hence typical proctoscopic and roentgenologic features. Its lesions begin in the most distal segment of the rectum, just above the anal canal. Diffuseness of involvement of the bowel is its pathognomonic feature. Whether 1 inch of the lower part of the rectum or 5 feet of bowel are involved, the involved segment always is affected in its entirety, its entire circumference and the deeper layers of the wall and the mucosa secondarily. This gives the granular, easily bleeding mucous membrane so characteristic of this lesion. The disease tends to spread upward until the entire colon, and even the lower part of the ileum in the late stages of the disease, become involved. Since it is primarily a disease of the intestinal wall, a very characteristic roentgenologic picture develops. The bowel becomes diffusely narrowed, haustral markings are erased, the flexures and curves become more angulated than those of the normal bowel and the result is a smooth tube. In this, streptococcic ulcerative colitis differs from all other forms of ulcerative intestinal disease, except perhaps regional enteritis when it is confined to the distal portion of the ileum. The latter condition has, however, many features to distinguish it from streptococcic ulcerative colitis. Because of the

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relatively high incidence of the streptococcic form of ulcerative colitis and because of the consistency with which its clinical, proctoscopic and roentgenologic manifestations conform to a certain pattern, I am inclined to use this type of ulcerative colitis as a norm and to describe other types chiefly by noting in what respects they differ from it.

This form of ulcerative colitis manifests itself in a variety of ways, but in general the clinical manifestations follow one of three general courses. When the lesions are limited to the lower segments of the large intestine, particularly the rectum and rectosigmoid, the onset of symptoms can be described as insidious. The patient may have normal motions of the bowel but in addition may pass two or three or many bloody, purulent rectal discharges. He may not have any other important systemic symptoms except that he will gradually begin to speak of not feeling well. His complaint of not feeling up to par may increase gradually as the number of rectal discharges increases and ultimately a mild form of diarrhea may develop.

The second common onset may be classified by saying that the symptoms are severe. The patient may start rather suddenly with bloody diarrhea, low grade fever and gradual loss of appetite and with them loss of weight and all the concomitants of a moderately severe illness. All the symptoms may start in a fulminating manner with an onset almost like that of lobar pneumonia or other similar serious illness. There will be a high fever, massive discharges of bloody material from the rectum, great prostration and rapid depletion.

A patient's symptoms may remain in the insidious form for months or years, and then at the time of an infection of the upper part of the respiratory tract some other intercurrent illness or perhaps some severe nervous trauma there may be a sudden exacerbation of the disease and a change to a severe or even the fulminating form.

The question is often raised whether these are different diseases or stages of the same disease. Experience seems to indicate that these are stages of the same disease attacking patients in various ways. Thus one must be ever on the alert for the occurrence of this disease in these several forms so that it may be distinguished carefully from the types of colitis which are to be discussed presently.

The treatment of this well defined entity is not as satisfactory as its clinical and pathologic picture might suggest. Nevertheless, if certain basic principles of therapy are followed the end results will usually be very gratifying. The disease is of the nature of a chronic destructive infection and so an adequate rest program must be devised. This may not necessarily mean rest in bed, for in the case of the milder types, in which the infection is confined to the distal segments of the large intestine, rest in bed would hardly be wise. Furthermore, the dictum that "disease below the diaphragm makes for pessimism" is well illustrated in this condition and therefore restful relaxation or a restful recreation is often more valuable than complete physical rest. However, when the disease advances to more proximal segments of the bowel so that diarrhea is severe, total body rest may be indicated. Reduction of intestinal peristalsis by any available means must be considered. Although minimal amounts of opium and its derivatives are indicated in selected cases, other sedative preparations and powders acting as adsorbents will often do much to allay intestinal peristalsis and thus create intestinal rest.

The second important measure of therapy is to improve bodily resistance to a severe infection and to replace the tremendous losses of food, especially proteins and vitamins, sustained in an active diarrhea. Thus a diet rich in calories, proteins and vitamins and low in residue is desired; however, it may be necessary to approach this very gradually, because during the fulminating stages of the disease it is often necessary to withhold food by mouth entirely. It may be necessary to begin by feeding perorally, gradually increasing the food intake very cautiously until finally in the more chronic stages of the disease a diet based on the foregoing principles and containing well over 100 Gm. of protein and extra amounts of vitamins is allowed.

Further protection against streptococcic ulcerative colitis is achieved by the cautious administration of an antistreptococcus vaccine. This can be given in increasing amounts, the injections being maintained always under the point of any local or systemic reaction.

Since most of these patients will come under the physician's observation after there has been considerable loss of blood, anemia will almost invariably be present and may reach profound degrees, and so the fourth method of combating the condition will be the administration of repeated blood transfusions. The average patient will tolerate a series of small transfusions, for example, 200 to 300 cc. of blood, better than the larger amounts of blood commonly given, that is, 500 cc. The various preparations of iron commonly administered to patients suffering from the hypochromic type of anemia are so often intestinal irritants that, when used, they should be given in minimal amounts and administered with great caution.

Various drugs of the sulfonamide series such as azosulfamide, succinylsulfathizole, sulfaguanidine and sulfathalidine have had ample trial in combating the active stages of streptococcic ulcerative colitis. So far, azosulfamide seems to be the drug of choice of this series for this type of colitis. The average amounts administered may range from 50 to 120 grains (3.2 to 8 Gm.), given in divided doses daily.

Penicillin has not been given an adequate trial in the treatment of streptococcic ulcerative colitis nor is it reasonable to expect this substance to affect more than the severe septic phases of this disease.

The removal of foci of infection such as obvious infections in the tonsils and teeth is of prime importance in combating this infection. Many other measures will come into play in the management of the individual cases of this form of colitis.

TUBERCULOUS ULCERATIVE COLITIS

Although infection of the intestine by Mycobacterium tuberculosis is primarily of the small intestine, it will commonly involve both small and large intestine, and some recent evidence tends to substantiate the thought that primary tuberculosis of the large intestine may occur. In the average case tuberculous ileocolitis is secondary to tuberculosis of the lungs or tuberculosis elsewhere in the body. The ulcers of this disease will be distributed irregularly and associated with lesions visible on the serous surface of the bowel and with miliary tubercles. The infection will commonly attack the ileocecal coil and only in the late stages will the lesions progress sufficiently caudad to be visible through the sigmoidoscope. Thus the roentgenologic examinations will be the essential diagnostic examinations and

will be featured by characteristic irritability with rapid emptying and filling of the ileocecal region, and great irregularity of the intestinal lesions will be observed in the roentgenogram. The smooth contour of the intestinal wall so commonly seen in cases of streptococcic colitis is not present in tuberculous ileocolitis because the disease involves more the mucosa than the wall of the bowel.

Although some chemotherapeutic agents related to the sulfonamide compounds, such as promin and promizole, bid fair to have value in the management of this disease, the accepted treatment is still adequate care in a sanatorium, this to include carefully regulated sun baths, a high caloric diet including especially large amounts of vitamin C in the form of such substances as tomato juice and a properly planned program of rest. Pneumoperitoneum and oxyperitoneum have been found helpful in some cases. Roentgen therapy also has its advocates.

ULCERATIVE COLITIS DUE TO THE VIRUS OF VENEREAL LYMPHOGRANULOMA

A third form of ulcerative colitis in which the lesions are limited to the large intestine is that caused by the virus of venereal lymphogranuloma. Here again the lesions start in the rectum and distal segments of the large intestine. The disease is also of the wall of the bowel but involves not only the wall but the lymphatic structures around it and so there develops a condition in which a stiff tube having the feel and giving obviously the appearance through the proctoscope of perirectal inflammation exists. There may be multiple small sinuses from the mucous membrane to the deeper structures and so a rather definite proctoscopic and roentgenologic picture results. The disease will be limited to the rectum and rectosigmoid structures and the normal bowel will be reached much more abruptly than in the streptococcic variety. Almost invariably the patient will feel generally well and his complaints will be largely in reference to the local rectal condition. The diagnosis in this type of case will depend largely on the history of previous venereal infection, possibly the presence of buboes and among women very commonly the presence of preceding vulval lesions. The Frei reaction will be positive. But even if these conditions exist the diagnosis of colitis due to the virus of venereal lymphogranuloma is not tenable if characteristic lesions of the rectum do not exist.

It used to be said that "when a patient once has an infection by the virus of lymphopathia venereum he will always die with it but never from it." The advent of the sulfonamide compounds may well change this dictum. Sulfathiazole, succinylsulfathiazole and sulfaguanidine have been particularly efficacious in the treatment of this infection. The latter two because of their lack of toxicity and minimal systemic absorption have been particularly useful since they can be administered in fairly large doses over a long period. Ten to 15 Gm. of one of the drugs has been administered daily for weeks to several months in selected cases, with a gradual reduction of the bloody rectal discharges. The stools have even become soft to formed, approaching normality not only in their consistency but also in their numbers. The intestinal wall has become softer and more pliable and the rectal lumen has gradually enlarged.

AMEBIC ULCERATIVE COLITIS

Another type of colitis in which the lesions are limited to the large intestine is that caused by Endameba histolytica. Here the lesions are localized primarily to the cecum and possibly the flexures of the large intestine, although the entire large intestine may be involved. If the disease has advanced sufficiently toward the rectum so that lesions are visible in its mucous membrane, they present a very characteristic appearance. The ulcers give the impression of being punched out, with raised edges covered by a fleck of mucus and a hyperemic zone around the individual ulcer. Between the ulcers the mucous membrane is relatively normal. The disease largely affects the mucosa instead of the wall, and there should be little difficulty in distinguishing this type of ulcerative colitis from the streptococcic variety of colitis. Consequently the symptoms are quite at variance with those of the streptococcic variety. Bleeding occurs relatively late in the disease instead of being present as one of the first symptoms. The severe prostration of the fulminating type of ulcerative colitis is observed rarely. The patient is usually in a relatively good condition.

Roentgenologic examinations too show a rather characteristic deformity of the large intestine when the disease is sufficiently advanced. However, even early in the disease there may be the characteristic features in the cecum; namely, some narrowing and irritability when no other colonic lesions exist. With the progress of the disease the cecum becomes coned or narrowed to a point and in the entire ascending colon may be narrowed irregularly. This is not a smooth diffuse narrowing such as one encountered in the streptococcic type of ulcerative colitis. As the rectum is approached there will be less and less roentgenologic evidence of disease except in those cases in which the greatest disease is at the flexures or in unusual segments.

Of all the forms of ulcerative colitis, the amebic is the most amenable to treatment. Without any additional supportive treatment, amebiasis can be controlled or perhaps cured in most instances by the properly timed administration of a suitable combination of preparations of ipecac, arsenic and iodine. A suitable program for the administration of these chemotherapeutic drugs is as follows: ⅔ grain (0.043 Gm.) of the active principle of ipecac, namely emetine hydrochloride, administered subcutaneously twice daily until 4 grains (0.26 Gm.) of the drug has been given. On the same day in which the emetine is given, 0.25 Gm. of carbarsone should be be given three times a day and administered for four days. This is to be followed by 0.25 to 0.5 Gm. of diodoquin for seven days, and this in turn is to be followed by a second course of emetine and carbarsone. A series of stools should be examined after this for the trophozoites or cysts of Endameba histolytica.

CHRONIC BACILLARY DYSENTERY

There is a form of ulcerative ileocolitis which follows in the wake of severe bacillary dysentery due to one or several of the strains of Shigella paradysenteriae. The fact that this condition follows, although very occasionally, an epidemic of acute bacillary dysentery will in itself be suggestive of the diagnosis. However, in the final analysis the diagnosis will depend on the presence in the blood of agglutinins (in significant titer, at least 1:320 or higher) of one or several strains of Shigella paradysenteriae. The lesions of this disease will be irregular and disseminated. In the occasional case in which extensive destructive ulcerative disease occurs, secondary invaders may be responsible for the late lesions. When lesions are visible through the sigmoidoscope and irregular as far as size, extent and mucosal appearance are concerned, they are particularly

striking. It has been said that the lesions are characteristic because of their irregular yet extensive distribution. This impression is substantiated by the roentgenologic appearance of the bowel in these cases.

Just as in cases of acute bacillary dysentery, so also in cases of chronic bacillary dysentery the sulfonamide compounds, particularly succinylsulfathiazole and sulfaguanidine, have given very satisfactory results. In mild cases and those caused by organisms of the Sonne type the disease has responded well to large amounts of succinylsulfathiazole. In more severe cases and particularly those caused by the Flexner and Shiga strains of these organisms it has responded better to sulfaguanidine, given again in fairly large doses. Type specific serums and bacteriophages have found little use recently and have been used only in the very severe cases in which every measure of therapy previously found useful has been indicated.

ULCERATIVE COLITIS OF UNKNOWN ORIGIN

There still exists a fairly large group of patients who have ulcerative colitis of unknown origin. Those who still cling to the terms "nonspecific" or "idiopathic" might well apply them to these groups of cases; however, the phrase "of unknown origin" can be much more suitably applied.

Here again the ulcerative disease may be extensive, involving long stretches of small and large intestine, or it may involve only the rectum and sigmoid. Whatever segment is involved, the appearance of the lesion is at variance with those of the conditions described having a specific cause and strikingly at variance with the appearance of the bowel in the streptococcic variety of ulcerative colitis. Agglutination of Shigella paradysenteriae will be absent. Cultures made from the lesions and examinations of the stools will not be diagnostic. The lesions will be distributed irregularly and tend to resemble those of amebiasis or tuberculosis. Yet, usually one will detect differences. The differences are sometimes hard to describe and it has been said that the ulcers are characteristic by being so uncharacteristic. The same thing will hold true as far as the roentgenologic examination is concerned. This is the group of cases that will particularly tax the physician's ingenuity, and the response to one form of therapy or another will often be minimal.

REGIONAL ULCERATIVE COLITIS

Another form of ulcerative colitis which may or may not be of similar origin to the last described has been designated as a regional type of ulcerative colitis. The lesions involve isolated segments of intestine and may involve any segment much in the manner of regional ileitis except that here the site of the disease is the colon. The lesion may be subacute or chronic and usually is quite destructive, but also there may be evidence of hyperplastic changes. Commonly segments of the intestine from 6 to 12 inches long are found to be involved, with perfectly normal bowel distal and proximal to the lesion, and the rectum is never involved. In other words, this segmental type of colitis involves regions of the large intestine above the view of the sigmoidoscope. The wall of the involved segment is also stiff and thickened but the involvement is not as diffuse, regular and smooth as in the streptococcic type of ulcerative colitis. Thus the roentgenologic examination is the most important objective method of establishing a diagnosis.

Usually such a regional type of colitis remains localized to a segment of large intestine for months or years. Very occasionally, however, it has been known to spread orad and caudad, so that ultimately even the distal portion of the ileum has become involved. The latter has initiated a difficult situation, indeed, and has always brought up the question whether this and so-called regional ileitis may not be the same or closely related conditions. However, the fact that regional ulcerative colitis usually remains localized to the large intestine, whereas regional ileitis commonly spreads from the ileum proximad to involve the jejunum and distad to involve the cecum and ascending colon raises a very definite question of their being separate entities.

In these cases the medical treatment is largely confined to the problem of rehabilitation for future surgical treatment. If the patient has fever and other concomitants of an active infectious disease the preoperative administration of succinylsulfathiazole in large amounts for days or weeks is indicated. If the patient has lost much weight and is anemic, these conditions should be corrected. Every known measure of therapy should be invoked to bring the patient to the best state of nutrition and reduce the infection to a minimum before resection is undertaken.

ALLERGIC COLITIS AND AN INTESTINAL DISORDER OF THE NATURE OF A DEFICIENCY SYNDROME

The type of intestinal disorder of the nature of a deficiency syndrome, other than sprue and pellagra, should actually not be discussed here. It is brought up only because there are still some who feel that the deficiency state plays a primary role in some of the types of ulcerative colitis which have been discussed. The history of patients suffering from an intestinal disorder in which a food deficiency is important is usually characteristic. Such persons may have gone for months or years on an inadequate dietary regimen. The result may be atrophy of the intestinal wall. The appearance of the bowel through the sigmoidoscope may suggest diffuse hyperemia. No real ulcers will be present. The roentgenogram may show dilatation of the large intestine with minimal changes of the mucosal pattern in the form of what appears to be a "fuzziness" of the mucous membrane, and in the small intestine a typical pattern of barium puddling and segmentation will be observed.

What has been said about the deficiency syndrome affecting the intestine might also be applied to so-called allergic colitis. Every one will accept the fact that there are patients who exhibit symptoms of intestinal allergy. Few will be impressed by the thought that such allergy is a primary factor in ulcerative intestinal disease. It seems obvious that occasionally in severe cases of intestinal allergy mucosal abrasions may occur, so that ulcers of a transient nature may be present. There is, however, little or no evidence available that these form the basis of a type of ulcerative colitis. It would seem better to consider intestinal allergy as a condition quite apart from the great problem of ulcerative enterocolitis, in the realization that it may play a part in many ulcerative intestinal inflammations but that it is not necessarily causative in any of them.

The treatment of these two conditions would seem obvious.

SUMMARY

There are many varieties of ulcerative colitis. It is of the utmost importance that the nature and cause of the disease in a given case be established as nearly as possible. Each form of colitis described has some characteristic features which set it apart from the others.

In the streptococcic variety the diffuseness of involvement and the typical proctoscopic picture together with the finding of the streptococcus are important. In the amebic variety the presence of Endameba histolytica is essential. In tuberculous colitis the presence of Mycobacterium tuberculosis together with the typical roentgenologic observations is diagnostic. In colitis due to virus of venereal lymphogranuloma the positive Frei reaction and the characteristic appearance of the lesions are essential. In colitis due to Shigella paradysenteriae, significant agglutination titer of the blood serum is important. In colitis associated with a deficiency state the history is all important. In so-called allergic colitis the allergic reactions of the patient will be helpful. In the groups of unknown cause and of the regional type, continued and careful study is essential. It is important that cases of the latter types be carefully distinguished from ulcerative colitis of specific cause, for in each type the treatment varies significantly and so one cannot stress too greatly the importance of a careful differential diagnosis.

INFLAMMATORY LESIONS OF THE COLON

SURGICAL ASPECT

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The generally recognized inflammatory diseases of the colon are appendicitis, tuberculosis, actinomycosis, radiation stricture, lymphogranuloma, chronic ulcerative colitis and diverticulitis. Obviously it is impossible to discuss all of these in any great detail in this short time. Therefore most of the time will be utilized in discussion of the more difficult and distressing ones, namely chronic ulcerative colitis and acute and chronic diverticulitis.

Appendicitis is the most common inflammatory disease of the colon. Certainly, every one agrees that the treatment is surgical—the earlier the better. The optimum time for operation in the delayed case depends on the judgment of the individual surgeon. Yet two things are quite apparent in spite of constant teaching: 1. The diagnosis is not made early enough. 2. The mortality is still too high, chiefly because of delayed recognition. Throughout the United States the mortality is quoted as being between 4.5 and 5 per cent. There is no doubt that the use of sulfonamides has helped to reduce the mortality and especially the morbidity in this disease, but their beneficial value should not lead to any attempt to use them in the so-called early case in preference to surgery.

Owing to public health measures tuberculosis and actinomycosis of the colon are becoming rare. When they occur, the cecum is the segment most commonly involved. The diagnosis is generally made by x-ray. The treatment is surgical and involves a right colectomy. The technic should be the one with which one is most adept, namely the one or two stage method with the open or closed anastomosis. I would offer one word of caution: Do not relax your judgment or surgical technic in the hope that sulfonamide will save you. In the past few months reports on the value of penicillin in the treatment of actinomycosis have been rather encouraging. The disease is chronic and slow, and if recognized a trial with the new medication is certainly indicated before surgery is attempted. At the present time we have under treatment a woman with multiple fistulas into the pelvis, colon and vagina who in a three week period has made excellent progress as evidenced by gain in weight, decreased discharge and normal temperature. The process has been of two years' duration without relief from all other treatments.

Lymphogranuloma chiefly involves the rectum and extends into the sigmoid. The chronic inflammation involves all the coats and produces pain, discharge and stricture. Medical treatment and dilation have failed to cure the disease, and frequently we have resorted to colostomy. Often the patient will improve considerably with a colostomy, but there is still considerable incapacitation from pain and discharge. After considerable experience with this pathologic process Zinninger [1] recently reported a series of cases showing that the best results come from abdominoperineal resection of the rectum in two stages with a permanent colostomy.

Radiation stricture of the rectum and sigmoid is always to be considered when a patient complains of bowel trouble following radium and x-ray therapy for carcinoma of the uterus. This may occur months or years after successful therapy and is frequently overlooked (in 1 case eight years). Its recognition is very important because, if it is mistaken for recurrence of cancer and further irradiation is advised, irreparable damage may be caused to normal organs, such as fistula into the bladder or rectum. The rate of recurrence in cancer is so high that almost any abdominal or pelvic pain may quite naturally and logically be attributed to malignant extension or metastasis. Before arriving at this conclusion, thorough sigmoidoscopic and roentgenographic studies should be made to eliminate the possibility of this curable condition.

I have encountered 18 patients with stricture in the small and large intestine, most of whom have been salvaged by recognition and appropriate surgery.

CHRONIC ULCERATIVE COLITIS

Regardless of the hope offered us for many years by the introduction of serums, vaccines, diet and sulfonamides, it cannot be said that there is any specific treatment at the present time for chronic ulcerative colitis. Much was hoped from the sulfonamide drugs, and certainly no one prayed for it more than the surgeon. With the failure of one compound another would appear for trial, almost as rapidly as the "one-a-day vitamins." My observation is that the sulfonamides have helped some, but I note that this therapy is not used alone. All other helpful things, diet and so forth, have been used in conjunction, and improvement cannot be attributed solely to specific therapy. We must not lose sight of the fact that the disease varies widely in gravity. It may appear suddenly and its severity be so great that death may occur in a period of a few weeks, or the attack may be less violent with few symptoms despite decided pathologic changes as seen by proctosigmoidoscopy.

The most striking and common clinical characteristic is the tendency to chronicity with recurrent mild to severe exacerbations. One patient may have several recurrences in one year, while another may go five years or longer with freedom from attacks. With this in mind it is readily understood why there exists a

From the Cleveland Clinic.
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1. Zinninger, M. M.: Cancer of Rectum, Cincinnati J. Med. 24: 25 (March) 1943.

wide difference of opinion as to the relative merits of various modes of therapy and as to the results obtained by any particular type of treatment. It baffles the surgeon as well as the medical man. How can the surgeon know that colostomy has arrested the process when that particular patient may have had immunity from attack for many years? This might also be true with any new therapeutic agent.

Pathologic Anatomy.—The disease tends to involve all coats of the bowel. The mucosal surface is denuded to a greater or less extent, and healing results in scar with or without heaping up of mucosal islands, pseudopolyposis, and ultimately stricture. The muscularis becomes thickened and the serosa edematous and injected. Healing of the muscular coat results in fibrosis and narrowing of the lumen of the rectum and colon. These changes alter physiology and result in nutritional deficiency from loss of food and fluids by diarrhea. It may act as a focus of infection, occasionally causing arthritis.

Complications.—(1) Perforation with general peritonitis or localized abscess with fistula formation (5 per cent); (2) hemorrhage (5 per cent); (3) stricture and narrowing of the lumen; (4) pseudopolyposis with a question of malignant degeneration (1 per cent).

Surgery has a definite place in the treatment. In early cases there is a division of opinion. There is also a division of opinion regarding the acute fulminating variety, if not complicated by hemorrhage. Surgery is definitely indicated for the chronic intractable variety. Cave and Mackie [2] state that when extreme anatomic changes have occurred it is vain to hope for restoration to normal.

Obviously, the only surgical treatment is ileostomy with or without colectomy. After ileostomy most patients improve generally and gain materially in weight but often are annoyed with frequent discharge of mucus and blood by rectum. In these cases it is necessary to do a colectomy. This is not an emergency operation and should be done in two or three stages after the patient is rehabilitated. Even then it has a mortality of 10 to 12 per cent. The optimum time for such a procedure is not less than three months after ileostomy. In a small group of cases (about 5 per cent) this process is limited to one segment of the colon. In such cases resection is advised, using the same technic as for malignant disease. The end results in this group of cases have been very satisfactory.

Diverticulitis.—In routine examination of the colon one will find about 60 cases of diverticulosis for every thousand cases examined. Of these 60 cases about 8 cases, or approximately 15 per cent, will present complications. I know of no abdominal ailment which calls for more individualization or taxes our surgical ingenuity more than diverticulitis and its complications. For practical discussion diverticulitis may be classified into three groups: (1) diverticulitis with enterospasm, (2) diverticulitis with infiltration and (3) diverticulitis with perforation. Group 1 is the most common of the three groups and is characterized by increasing constipation, change in bowel habits and soreness in the lower part of the abdomen. Frequently an attack may be precipitated by a strong laxative taken for the constipation. There is rarely any elevation of temperature or leukocyte count. In these patients it is possible to palpate a spastic sigmoid which is definitely tender. The x-ray examination shows a characteristic finding of diverticula with a double saw-tooth appearance of the sigmoid due to spasm of the circular muscle fibers. Treatment in this stage is medical: rest in bed, hot packs, antispasmodics and small doses of phenobarbital. If the process does not subside under this treatment, it may progress to stage 2; namely, diverticulitis with infiltration. X-ray examination shows an increase in the deformity due to inflammation and edema of the bowel wall. The filling defect is quite long. This is a valuable point in differentiating the process from carcinoma, in which the filling defect is limited to a narrower segment. Furthermore, the edema in the bowel wall may close off the ostiums of the diverticula so that they may not fill with barium and consequently are not visualized.

The treatment in stage 2 is medical also until complications arise. Obstruction is the chief complication in this stage. It is due to tremendous thickening in the mesentery and all coats of the bowel. Here clinical judgment alone determines the optimum time for surgical intervention. The duration of the ailment, the general condition of the patient, the degree of distention and the presence or absence of vomiting must all be considered in making the decision. I tend to be conservative. If surgery is indicated in this stage, I think it should be limited to a colostomy at some distance above the mass, preferably the transverse colon. This procedure will take care of the emergency, and the process will usually subside. After convalescence, progress studies by sigmoidoscopic and roentgenographic examination will determine the future course. The process may subside entirely so that the colostomy may be closed, but the patient should be encouraged to keep the colostomy for six months to a year to insure complete subsidence.

If the diverticular process is shown by x-ray examination to be limited to a 4 to 6 inch segment, it is wise to consider resection of this segment while the patient has a colostomy. If the process is more extensive, resection may not be feasible, whereupon the patient must be fully informed and must assume part of the risk if he insists on closure of the colostomy. Rigid bowel management should follow closure to prevent further trouble.

In the third stage, diverticulitis with perforation, the perforation may be acute or chronic, and, while fewer cases occur in this group, they present definite difficulties in diagnosis.

In the acute fulminating variety the symptoms are so alarming that it constitutes an emergency, and frequently the diagnosis is not made until after exploration. The preoperative diagnosis is generally acute appendicitis, volvulus or perforation of a viscus. It is not surprising that the diagnosis of acute appendicitis is most commonly made because the involved segment of the sigmoid is frequently in the midline or on the right side. The only responsibility at this time is to save the life of the patient, and, as in any emergency, we must carry out only the simplest surgical procedure, namely incision and drainage. We should not attempt to close the perforated areas with sutures, because they will not hold in the infected edematous wall of the intestine. Furthermore, it is time consuming and traumatizing and may break down protective barriers. Many of these patients die of intestinal obstruction and not of infection; therefore, while the infection may be localizing and may be dealt with later, the use of the Miller-Abbott tube postoperatively is of great value.

2. Cave, H. W., and Mackie, T. T.: Chronic Ulcerative Colitis, South. M. J. **31**: 414, 1938.

The judicious use of the sulfonamides intraperitoneally and systemically is valuable. If the surgeon does not see these cases until twelve to twenty-four hours have elapsed, he must use his clinical judgment as to whether operation should be performed immediately or whether he should use symptomatic treatment and wait for localization.

Chronic or, in other words, gradual progressive perforation with formation of a peridiverticular abscess confronts the surgeon with a real problem, from both a diagnostic and a therapeutic standpoint. From the standpoint of differential diagnosis we must consider malignant disease, tubo-ovarian abscess or pathologic conditions of the genitourinary tract when there is frequency of urination and pain referred to the kidney or bladder. In the presence of a diverticular abscess one of the following processes may occur:

1. It may perforate into the bowel with discharge of pus.
2. It may perforate into the bladder.
3. It may perforate into the surrounding tissue and become walled off.
4. It may perforate through the pelvic floor and may simulate an ischiorectal abscess or fistula in ano.

If it perforates into the rectum it is a fortunate and happy sequel. Treatment is symptomatic and should be directed along medical lines. If it perforates into the bladder, a vesicocolic fistula results. This is a miserable complication evidenced by irritability of the bladder and the passage of pus, feces and gas through the urethra. The first step in handling such a condition is to make a colostomy high in the sigmoid or preferably in the transverse colon to sidetrack the fecal current. This should be followed by irrigation of the colon and bladder. If the opening is very small it may close spontaneously, but in this case the colostomy should not be closed for many months, after one is assured by cystoscopy and barium x-ray examination that healing has occurred. In most cases it is necessary to dissect the colon from the bladder and to close the openings. Obviously, it is of great advantage to have a preliminary colostomy before the procedure is attempted. Finally, if the perforation is into the mesentery or surrounding tissue it becomes walled off. Generally the inflammatory process makes its way to the abdominal wall and may be incised extraperitoneally when it points. However, during this waiting process symptoms of obstruction may develop which may cause the surgeon some anxiety. In this case a cecostomy or transverse colostomy should be performed.

Whether the abscess opens spontaneously or is opened surgically, frequently a fistula will result, and the next problem is what to do about this fistula. This will depend on many factors. If the patient did not require a colostomy, I would not do anything about the fistula for a long time. I have seen fistulas close after a year of drainage. If a colostomy has been done, undoubtedly the patient wishes it closed. In this case the fistula should be injected with bismuth to outline the tract, and a barium enema should be given to estimate the extent of the bowel involved in the diverticular process. If a small segment is involved (4 to 6 inches), resection of this segment, including the fistula, should be undertaken before the colostomy is closed. It is not good surgery to dissect out the fistula alone and close the opening, because in most cases it will fail and the fistula will reform.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BARGEN AND JONES

DR. DONOVAN C. BROWNE, New Orleans: Unquestionably to Dr. Bargen must be given credit for our much clearer pathologic and clinical concepts of certain of these entities. Whether one wishes to subscribe to his classification remains a matter of legitimate opinion and stimulates study. With the available data, avoiding the legion of unsupported hypotheses, I find myself somewhat in accord—certainly when viewed purely from the histopathologic and clinical standpoint. Some years of observation in an area where diarrheas and dysentery are not uncommon have failed to yield sufficient evidence in any manner to establish thrombo-ulcerative colitis as a stage of, or aftermath of, bacillary dysentery, either the acute or the chronic form. Coexisting disease entities occur all too frequently with diseases of the colon. This week we have pointed statistically to a 12 per cent incidence of concomitant disease in some 800 cases of amebiasis, which becomes significant in instances of failure to respond to adequate therapy. This may explain many of our failures. A most important feature of this presentation, aside from giving an excellent summary of what we know and may well depend on in ulcerative lesions of the colon, it points vividly to what we do not know. With much improved photography, as presented by Dr. Buie, a better understanding may result. Certainly when greater numbers may see and study the same lesion, the possibility of interpretations coinciding are increased; also the much more common use of the proctoscope increases the probability of biopsy and pathologic diagnosis. I have never been able to understand the fear and ultraconservatism manifest by so many in taking biopsies. Certainly it is neither difficult nor dangerous. The diagnosis as usual remains the basis for therapy. The sulfonamides in thrombo-ulcerative colitis have been disappointing in our hands and must remain an adjunct to management of the disease, but in lymphopathia I wish to stress that patients after long months of treatment have been rewarded with satisfactory results.

DR. RAYMOND W. MCNEALY, Chicago: There is no standard surgical management which is applicable in every case of chronic ulcerative colitis. Rest of the colon is important in the acute phase. Ileostomy should be done before irreparable damage to the colon has occurred. This operation is delayed too long in most instances. Patients with ileostomies should not suffer from nutritional disturbances—if they are carefully supervised and if the chemical and nutritional imbalances are corrected as soon as they appear. No one regards a colectomy as a curative procedure. It is done in order to remove a useless damaged intestine which by its presence may continue to undermine the health of the patient. It is a source of danger from hemorrhage, stricture, perforation and malignancy. Colectomy should not be done as a heroic procedure when the patient's condition is considered desperate but should be reserved for the chronic cases and then done in stages. One of my keenest disappointments has been the failure of either the sulfonamides or penicillin to have any appreciable effect on this group of patients. Some patients with diverticulitis have few symptoms before perforation takes place. Those who develop a perforation with spreading peritonitis require immediate exploration. A proximal colostomy or ileostomy with exteriorization of the lesion will meet the requirements in most cases. There are some patients in whom a perforation permits a rapid flow of large bowel contents into the free peritoneal cavity. In the absence of restraining adhesions the contents diffuse quickly and cause a widespread fulminating peritonitis which usually destroys the patient. In chronic infiltrative and obstructive types of diverticulitis great care should be exercised in preparing these patients for surgery. I have found sulfonamide drugs very helpful in reducing the morbidity and mortality in these cases. Conservatism should be the rule. Probably a definite transverse colostomy with a spur, not a colostomy in continuity, is the treatment of choice. Many of the infiltrative varieties will clear up if set at rest for a long time. Those which do not improve may be prepared adequately with succinylsulfathiazole and then resected. In localizing abscesses there is a tendency to do too much surgery. Simple incision and drainage is the wisest procedure.

DR. M. H. STREICHER, Chicago: I agree with Dr. Bargen about the importance of the classification, so that one is talking about the proper type of case. In the last year and a half, at the University of Illinois, we have worked on sulfathalidine. We have reported bacteriologic, clinical and chemical blood studies in 47 cases. Our results with sulfathalidine have been encouraging. Dr. Bargen's statistics on the average of good results in ulcerative colitis compare well with ours over an eighteen or nineteen year period. That leaves about 15 per cent which do not get along or which meet with some complications that need surgery. I hope Dr. McNealy is right, that a new miracle will cut that 15 per cent down to zero.

DR. J. ARNOLD BARGEN, Rochester, Minn.: The indications for surgery for the various types of ulcerative colitis in my experience vary with the type of colitis at hand. For the streptococcic type of ulcerative colitis the only curative surgery would seem to be an ileostomy proximal to the inflammatory intestinal disease followed by subtotal or total colectomy. In the ulcerative colitis of undeterminate etiology, not including the segmental variety, this too would be the surgical treatment of choice. This, then, brings up the question of when to advise surgery. From a study of a series of 185 consecutive ileostomies reviewed by Drs. Pemberton, Ashburn, Lindahl and myself, a review of which was published in the *Annals of Internal Medicine* in January 1943, and from our experience in observing these patients, it has become apparent that ileostomy and other subsequent surgery is best limited to complication of ulcerative colitis such as extensive perirectal infection with abscess and fistula, intestinal stricture, extensive secondary polyposis, a walled off colonic perforation, secondary malignant neoplasia and the occasional case of severe arthritis. Then, of course, ileostomy is not performed for ulcerative colitis but rather for another condition complicating the ulcerative colitis. Only occasionally will ileostomy be indicated for the so-called intractable case of ulcerative colitis. Hardly ever will it be indicated for the severe fulminating case of ulcerative colitis which we have referred to repeatedly and which was also mentioned by Dr. Jones. Surgical results with the latter type of case have been most disappointing. The use of one of the sulfonamides, the anticolitis serum, blood transfusions, intravenous feedings, administration of concentrated oxygen and other supportive measures have carried many of these cases through to recovery. Surgery for the regional type of ulcerative colitis or the case of segmental tuberculous colitis is usually in the nature of resection of the diseased segment and establishment of ileocolostomy in some form. Surgery for the ulcerative colitis due to the virus of lymphopathia venereum will rarely require more than a colostomy. For other types of ulcerative colitis, particularly the streptococcic type, colostomy in our hands has been disappointing. Great progress in the management of the various types of ulcerative colitis has been made, not the least important of which is our knowledge of a satisfactory classification of the various forms of ulcerative colitis. The group of diseases which we have referred to here still stands as a challenge to the clinician and medical investigator as well.

DR. THOMAS E. JONES, Cleveland: I agree entirely with Dr. McNealy's remarks about anastomosis. Most cases of peritonitis result from leakage at the suture line and not from contamination at the time of operation. Therefore this may happen with the closed or open type of anastomosis. That is why I emphasized that one should do the type of operation with which one is most familiar.

Intelligence Tests.—The inference that laborers are dull as a rule is mistaken. Data from Army intelligence tests show for example that at least one fourth of those who reported their occupations as laborers in the sample population study did better than the median of the total Army population. Tests made in factories showed that scores of workers in certain labor groups varied all the way from 60 to 169 and, while the median score was 112 (slightly lower than for any other group in the factory) it was significant that there were among the laboratory group and draftsmen, and also among the foremen, those whose scores were below the median.—Davis, John E.: Principles and Practice of Rehabilitation, New York, A. S. Barnes & Co., Inc., 1943.

USE OF PENICILLIN IN PREVENTION OF POSTOPERATIVE EMPYEMA FOLLOWING LUNG RESECTION

REPORT OF A CONTROLLED STUDY

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Most attempts to measure the potentialities of a drug in wound infections, whether in terms of prophylaxis or of treatment, suffer from extreme degrees of variation in the lesions studied. The wound variations occur in respect to size, depth, anatomic location, inflicting agents, degrees of contamination, types and numbers of organisms present and the amount of contained foreign matter. Wounds also vary with the individual patient as to age, concomitant disease, nutrition, individual host resistance and healing capacity. Still another source of variation is the management of the wound, the time elapsed between injury and definitive treatment, the extent of débridement and of wound closure, the degree of tension in closed wounds, adequacy of immobilization, frequency of dressings and the duration of hospitalization. In established infection all of these variables are present plus the factors of bacterial invasion, bacterial toxins and bacterial symbiosis, which further complicate the picture. Hence it is considerably more difficult to assess the efficacy of a drug in surgical infections than in the more uniform nonsurgical diseases such as pneumonia, cerebrospinal meningitis or gonorrhea, in which factors relating to the presence of a wound are nonexistent.

In any clinical study it is important to avoid erroneous conclusions based on impression by employing adequate and comparable controls. When the clinical material is variable, controls are difficult to evaluate; however, if similar cases in experimental and control groups are paired, the influence of variation will be reduced. If this method is followed it is essential that the experimental and control cases be observed concurrently.

This study was designed to minimize the factors of variation, to offer adequate and comparable controls and to provide a clearly definable end point as the basis for evaluating the agent. Therefore our objective could be simply stated as follows: "To determine if penicillin is of value in the prevention of empyema following transection of the bronchi."

Several minor considerations have necessarily entered into the project, such as the therapeutic response to penicillin manifested by the underlying disease and the

This work was carried out under a contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development, Washington, D. C., and the University of Pennsylvania. The Responsible Investigator on this contract was John S. Lockwood, M.D.
This study was made possible by the cooperation of the surgical, bronchoscopic, bacteriologic and x-ray departments of the Temple University Medical School and Hospital, the Hahnemann Medical College and Hospital and the Abington Memorial Hospital. Technical assistance was given by Miss Cecile Chemerda, Mrs. Catherine Collins Dietz, Miss Jean I. McKinney and Miss Jean Gates.

effect of systemically administered penicillin on the bacterial flora of sputum and bronchial secretions. This study also presented an opportunity to determine whether bacteria in the bronchi are the source of infection in those cases in which empyema developed and to evaluate the use of penicillin in the treatment of extrapulmonary suppurative infections following lobectomy or pneumonectomy.

In a study of the prevention of infection following elective lung resection, the clinical material is standardized in a rather unique way. With removal of lung tissue a dead space remains, which fills rather promptly with serum and with varying amounts of blood. The only avascular tissue present is that distal to the ligated hilar structures, and this is minimal in amount and more or less constant in extent. There is very little mobile soft tissue to aid in the walling off of infection, and the effectiveness of host resistance alone is quite limited. These conditions offer an ideal situation to permit bacterial growth, namely a collection of enriched body fluid in a rigid dead space containing no omental-like structure to aid in localizing the infection. Thus any organism that becomes established in this fluid will tend to produce an empyema even though it may not be primarily of a highly invasive type. At the same time the pleura provides a partial barrier against extending infection.

It appears that these circumstances offer an excellent opportunity for evaluating the usefulness of penicillin as a prophylactic agent.

OUTLINE OF THE PROJECT

1. Patients were considered for this study only after the decision had been made to perform either lobectomy or pneumonectomy. This avoided the influence of penicillin prophylaxis in selecting patients for operation.

2. Cases were paired as closely as possible to minimize the influence of uncontrollable variation, 1 case being assigned to the control series and its mate being placed in the group for treatment.

3. The decision as to whether a patient was to receive penicillin or serve as a control did not rest with the operator but with an impartial observer.

4. Penicillin was given in experimental cases for one week preoperatively and two weeks postoperatively.

5. In experimental cases 150,000 units of penicillin was administered daily with the exception of one 8 year old child, who received 100,000 units daily.

6. The intramuscular route of administration was used in all cases, injections being given every two hours in equal amounts.

7. No local penicillin was used in the pleural space before, during or after operation unless an obvious empyema had developed, in which case the experimental result was already determined.

8. In the event that empyema developed in control cases, penicillin therapy was given by various routes in an effort to control the infection.

9. No sulfonamides or other therapeutic agents were used either systemically or locally in treated or control cases.

10. Three thoracic surgeons participated in this study. Two of them worked together employing identical technics, which facilitated the pairing of cases. The third surgeon worked independently and provided pairs which were kept separate from those of the other two surgeons.

11. One stage procedures were performed in all cases included in the final analysis.

12. A daily record was kept of the amount, character and odor of all sputum.

13. Every patient was examined carefully for the presence or absence of active tuberculosis.

14. Cultures of sputum or bronchial secretions were usually obtained for two days before penicillin was started in treated cases or for two days before operation in control cases. Frequent cultures were made of the sputum of patients in the penicillin series during the week of preoperative therapy. Postoperatively sputum cultures were obtained at frequent intervals for at least two weeks.

15. In one of the collaborating hospitals, bronchoscopic examinations were performed frequently, specimens being obtained for culture.

16. Complete x-ray studies were obtained in all cases.

17. Chest fluid for definitive bacteriologic analysis was usually obtained by needle aspirations, although frequent cultures were made of tube drainage.

18. A comprehensive work-up, including routine and special laboratory studies as indicated, was done in all cases.

The following is an outline of the operative routine of the collaborating surgeons. Two of the men working in one clinic followed procedure A and the other surgeon used procedure B.

Procedure A.—I. Pneumonectomy: Incision was made in the third interspace through the pectoralis muscles and extending from the sternum to the anterior axillary line, with continuation of the incision in the interspace to the paravertebral line. Ribs were spread and not resected. The mediastinal pleura was opened and the pulmonary artery and veins were dissected free. Each was doubly ligated and transfixed with number 1 chromic catgut and divided between transfixion and distal ligatures. Remaining tissue was dissected from the bronchus, which was doubly clamped with heavy hemostats. The field was isolated with acriflavine gauze and the bronchus amputated at the distal clamp, leaving the stump protruding from the proximal clamp. The stump was then swabbed dry and culture made of this material. The stump was treated with phenol and alcohol and closed with Michel clips. Isolating gauze and all instruments and gloves were discarded, after which the reflected pleura or pleural flaps were closed over the stump with continuous and interrupted 00 chromic catgut. The chest was closed in layers, and air was aspirated to give a mild negative pressure.

II. Lobectomy: The differences were only in the approach, which was made through the seventh rib bed. After resection, drainage was instituted through a stab wound by mushroom or straight catheter.

Procedure B.—I. Pneumonectomy: A curved parascapular or posterolateral incision was made and carried through all the muscles in the line of the skin wound. The sixth rib was usually removed. The mediastinal pleura was incised and the main bronchus to the lung was located. This was clamped with a noncrushing clamp close to the bronchial margin. A crushing clamp was then applied distally to this point and the bronchus divided between them. The pulmonary artery to that lung was doubly ligated with one silk ligature and one transfixion suture ligature; it was then divided distally. The pulmonary veins were treated in a similar manner and the lung dissected free and removed. The bronchus was closed with a medium silk ligature or simple end sutures of fine silk. A flap of parietal pleura was mobilized and sutured to the anterior bronchial surface

with interrupted fine silk sutures. The chest was closed in layers and pressure controlled by aspiration of air. In 8 of the 13 cases done by this method, tube drainage by intercostal catheter was utilized.

II. Lobectomy: The technic is much the same as for pneumonectomy. Closed drainage with an intercostal number 24 French catheter was used in all but 5 cases. The drainage tube was connected to a water sealed bottle.

Criteria.—We have chiefly concerned ourselves with the value of penicillin in preventing the development of empyema. Because of this, patients who died within four weeks postoperatively from causes entirely unrelated to infection are not considered among the completed cases. Cases that came to operation but were not resectable and those with recent empyema or draining sinuses were likewise excluded from the statistical analysis.

In this study patients with purulent pleural fluid containing viable organisms and demonstrating a systemic reaction characteristic of infection were considered to have empyema. All purulent chest fluids have been studied bacteriologically, and all have produced bacterial growth at one time or another. The mere presence of bacteria without evidence of pus or other signs of infection was not considered to be indicative of infection. A febrile response of some degree is to be expected following lung resection and may often be explained on a basis other than infection. First the operative procedures are exceedingly traumatizing and prolonged and result in a dead space which contains blood and serum, the absorption of which is usually associated with fever. Secondly, there is a disturbance of physiologic equilibrium. Third, patients with suppurative pulmonary infections or tuberculosis usually have some involvement in the remaining lung tissue, and activation of these lesions frequently follows lobectomy or pneumonectomy. When the fever is due to infection the patients appear toxic, the elevation of temperature is usually sustained and the diagnosis is completed with recovery of purulent material and viable organisms from the chest.

Chest fluid for definitive studies was obtained by thoracentesis unless tube drainage from the pleural space revealed copious amounts of pus.

If at the end of four weeks after operation there was no evidence of infection, a patient was considered uninfected in this study. The only pyogenic infection which this limit excludes is 1 purulent empyema which developed after seven weeks in a control case. Two patients in the tuberculosis series who received prophylactic penicillin developed tuberculous empyemas after the four week period of evaluation. One of these showed a nonpathogenic staphylococcus after the bronchus had opened.

RESULTS

A total of 48 patients had partial, single or multiple lobectomy or pneumonectomy. Of these, 41 are suitable for analysis by the criteria set forth. Seven patients died within four days postoperatively without infection. Six patients who were explored without removal of lung tissue were excluded from the study, since bronchi were not transected.

Pairing of cases has been difficult to achieve. Consequently only 30 of the 41 have been suitably paired. However, the presence of unpaired cases does not significantly alter the results, since the differences between treated and control groups is so great.

Of the 41 patients 21 received penicillin prophylactically and 20 served as controls. None of the penicillin patients showed evidence of a pyogenic empyema, while 12, or 60 per cent, of the controls developed pleural suppuration. One patient with bronchogenic carcinoma who received penicillin did become infected but is excluded from the statistical analysis, since he died on the fourth postoperative day from causes not related to infection. This case is discussed under postoperative deaths where the reasons for exclusion are explained.

BRONCHIECTASIS AND MULTIPLE ABSCESSES

Penicillin demonstrated its greatest value in cases of suppurative pulmonary infections. Twenty-one patients had partial or total lung resection for bronchiectasis or multiple lung abscesses. Seventeen of them had partial, single or multiple lobectomies, while only 4 of them had total lung resections. The treated group included 10 lobectomies and 2 pneumonectomies. None of these patients developed any evidence of intrapleural infection. The control group consisted of 7 lobectomies and 2 pneumonectomies, in all of which empyema developed. In 3 of these cases, 2 lobectomies and 1 pneumonectomy, death occurred. Infection was overwhelming in all 3 instances and contributed to ultimate death of the patients.

Surgery was an elective procedure in all 21 of these cases. Preoperatively there was little febrile reaction and the volume of sputum was minimal.

Of the 21 cases, 18 have been appropriately paired. The incidence of empyema remains the same, 100 per cent in control cases and none in treated cases.

Four patients had gross contamination of the pleural space at operation resulting from an unavoidable spill of purulent material. Three of these cases, 2 lobectomies and 1 pneumonectomy, were in the control group. The fourth case, a partial lobectomy included in the penicillin series, showed no evidence of empyema. From this case and 2 of the controls, hemolytic streptococci were recovered preoperatively in the sputum. The same organism was present in the empyema which subsequently developed in the control cases and was present in a large abscess found in the surgical specimen removed at operation from the patient who received penicillin.

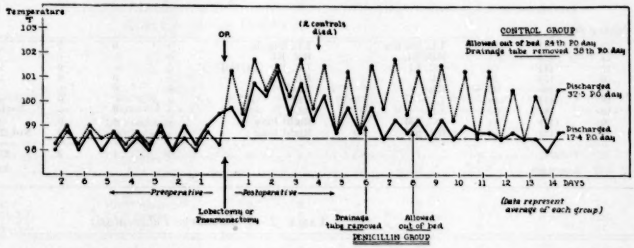
The patients who received penicillin for seven days preoperatively were in good condition when the therapy was instituted; therefore there was little evidence of clinical improvement that could be attributed to penicillin. Five of the 12 patients in this series demonstrated a decrease in sputum volume before operation, and 2 of them exhibited a change in sputum character recorded as thinning and decrease in purulence. There was little evidence of penicillin effect bronchoscopically other than an occasional decrease in purulence of the bronchial secretions.

The control cases varied considerably in their postoperative course from a slight reaction to infection to a stormy course which resulted in the death of 3 patients (13, 14 and 21). The 12 patients who received penicillin had an essentially uneventful convalescence. The average daily low and high temperatures of the two groups of cases were calculated and plotted, as shown in the accompanying chart. The highest postoperative temperature recorded for a treated patient was 102.4 F., while 4 of the controls exceeded 103 F. Of the 3 patients who died of infection, patients 13 and 21 died on the

fourth postoperative day and patient 14 on the twenty-second postoperative day.

The bronchial closure in all of the treated patients apparently remained secure, while 3 of the control subjects developed bronchial fistulas. There were no wound infections in the treated group, while 4 were observed among the control cases. The average number of postoperative days of tube drainage in those in whom drainage was done was 6 in the penicillin group and 38.7 in the controls who survived. The average postoperative day out of bed was 8.4 in treated patients and 24 in the controls. This includes only survivors. The average postoperative day of discharge with prophylactic therapy was 17.4, while the survivors of the nontreated group averaged 37.5 days of postoperative hospitalization. In 6 pairs of patients, all of whom survived, the treated ones remained in the hospital for a total of one hundred and twenty-three days postoperatively, while the controls totaled two hundred and twenty-five. This was a saving of one hundred and two days of hospitalization, or an average of seventeen days per patient. Secondary thoracotomy for empyema drainage was necessary in 6 of the control cases. The results are presented in the accompanying chart.

There were 4 patients in the prophylaxis group who demonstrated some degree of contralateral involvement preoperatively. None of these showed any evidence of acute activation of remaining areas of suppuration postoperatively.



Calculated average daily high and low temperatures in bronchiectasis and multiple lung abscesses: solid line, penicillin prophylaxis series, 12 cases; dotted line, control series, 9 cases.

TUBERCULOSIS

Fifteen patients had partial or total lung resection for tuberculosis. Seven of these were treated and 8 served as controls. Three of the operations in the treated series were lobectomies and 4 were pneumonectomies. The control group consisted of 4 lobectomies and 4 pneumonectomies. These patients were usually selected for lobectomy or pneumonectomy because of endobronchial tuberculosis with resultant stenosis or cavitary pulmonary tuberculosis which had not been amenable to collapse therapy such as pneumothorax thoracoplasty or revised thoracoplasty. While these patients demonstrated varying degrees of superimposed pyogenic infection, their lesions were fundamentally tuberculous. Eleven of these patients were febrile preoperatively, their temperatures exceeding 100 F. and some reaching 103.6 F. Two controls and 2 treated patients were essentially afebrile preoperatively.

At least 3 of the cases in this series could not be classified as elective, since it was felt that the nature of the disease required early surgical intervention.

All 15 patients were operated on by the same surgeon.

There were 5 treated and 5 control cases which could be suitably paired. The 5 paired controls showed essentially the same incidence of empyema (40 per cent) as the entire control group of 8 patients (37.5 per cent), including the 5 paired and 3 unpaired. Two of the paired prophylaxis patients (22 and 23) developed tuberculous empyema and bronchopleural fistulas after the four week period of postoperative observation. Both were heavily inoculated with tubercle bacilli by the accidental rupture of tuberculous cavities at the time of operation. Patient 22 was discharged on the twenty-fifth postoperative day but was readmitted six days later with an empyema and a bronchopleural fistula. A biopsy of the pleura revealed tubercle bacilli, while the thin and somewhat purulent chest fluid contained nonpathogenic staphylococci. In spite of thoracotomy and an upper stage thoracoplasty, this man developed a contralateral tuberculous spread and died. Patient 23 displayed acid fast bacilli on smear of his chest fluid shortly after operation. On discharge on the forty-eighth postoperative day this patient returned to the sanatorium. Shortly thereafter a tuberculous empyema drained spontaneously through the healed wound. It was then determined that he had a bronchopleural fistula. No pyogenic bacteria were recovered from the chest fluid, cultures of which were taken on six occasions. The draining sinus is healing slowly.

Of the 7 patients in the treated series, 2 with a predominance of pyogenic infection improved clinically during the week of preoperative administration. Two others with extensive tuberculous involvement had a steady increase in temperature. Two of the 7 had a slight decrease in sputum volume. The character of the sputum was not significantly altered in any of the 7.

Two of the 3 pyogenic empyemas (31 and 34) which occurred in the control group were caused by nonpathogenic staphylococci. Both cleared quickly with local and systemic penicillin therapy. The third case (35) demonstrated an untypable pneumococcus, first in the sputum, later in the empyema and subsequently in the pericardium and wound. A bronchopleural fistula developed on the thirty-second postoperative day. Death occurred two weeks later as a result of the extensive infection. Autopsy revealed a pyogenic and tuberculous empyema and pericarditis. One other patient, number 36 in this series, developed a staphylococcic empyema which was not discovered until the fifty-fourth postoperative day. Since it had been more than four weeks postoperatively when the empyema was noted, this patient is considered as an uninfected control.

Bronchopleural fistulas occurred in the 2 penicillin patients who developed tuberculous empyemas, as discussed. Fistulas also occurred in patients 31 and 35, both of whom were infected controls. There were no wound infections in the treated group, while the wounds of 2 of the controls became infected. The average number of postoperative days of drainage given patients who had tube drainage and survived was 4.0 in the treated series and 3.3 in the nontreated. One of the 2

treated patients with a tuberculous empyema required a late thoracostomy; the other pointed, ruptured and drained spontaneously. Three of the controls required early thoracostomy. The average postoperative day out of bed in the treated series was 11.1 and for the controls 16.9. The average postoperative day of discharge was 27.0 for the penicillin group and 35.4 for controls. There were two deaths due to infection, one in the treated series and one in the control series. Both had mixed tuberculous and pyogenic empyemas.

Of the fifteen experimental and control subjects, 11 had a sustained postoperative fever. Nine cases exceeded 103 F., 3 of which reached 105 F. The temperature of 2 patients fluctuated between 101 and 103 F. Four patients, 3 of whom received penicillin, did not exceed 101 F. Four controls and 1 treated patient had definite activation and spread of their tuberculous lesions following lung resection.

A tabulation of the results in this series of cases is presented in table 2.

TUMORS

None of the patients with bronchiogenic carcinoma, whether treated or control, developed infectious complications. One patient in this group had a partial lobectomy after tumor biopsy examined by frozen section and reported nonmalignant. However, on examination of the resected lung tissue a malignant tumor was found.

This group of patients includes only 5 cases, 2 treated and 3 controls. Only one pairing can be made. The average days of drainage, postoperative day out of bed and postoperative day of discharge are not significantly different in the penicillin and control series. These results are presented in table 3. Because of the limited number of cases and the absence of infection it is impossible to draw any conclusions as to the effects of penicillin.

TABLE 1.—*Bronchiectasis and Multiple Lung Abscesses*

Case No.	Paired with Case No.	Age	Lobe(s) Involved	Lobe(s) Removed	Empyema	Wound Infection	Bronchopleural Fistula	In Terms of Postoperative Days: Drainage Tube Removed	Required Secondary Thoracotomy	Allowed Out of Bed	Discharged
Penicillin Series											
1	(13)	27	LL, lingula	LL, lingula	0	0	0	5	0	10	14
2	(14)	65	RM, RL, LL	RM, RL	0	0	0	3	0	8	14
3	Not paired	20	RL, LL, lingula	RM, RL	0	0	0	3	0	9	14
4	(15)	38	LU	LU (partial)	0	0	0	11	0	11	22
5	(16)	8	RU, RM	RU, RM	0	0	0	6	0	6	16
6	(17)	42	RM, RL	RM, RL	0	0	0	6	0	6	14
7	(18)	29	RL, LL, lingula	LL, lingula	0	0	0	12	0	13	43
8	(19)	17	LL, lingula	LL, lingula	0	0	0	4	0	6	14
9	Not paired	43	RM, RL, LL, lingula	LL, lingula	0	0	0	4	0	10	15
10	Not paired	42	LU	LU (partial)	0	0	0	6	0	6	15
11	(20)	62	RU, RM, RL	Right lung	0	0	0	Not drained	0	10	14
12	(21)	26	LU, LL	Left lung	0	0	0	Not drained	0	6	14
	Totals				0	0	0	60	0	101	209
	Averages							6		8.4	17.4
Control Series											
13	(1)	33	LL, lingula	LL, lingula	+	0	0	..	+	..	Died
14	(2)	14	RM, RL	RM, RL	+	+	+	..	+	..	Died
15	(4)	56	LU, LL	LU, LL, (partial)	+	+	0	20	0	55	60
16	(5)	29	RL	RL	+	0	0	30	+	26	40
17	(6)	26	RL	RL	+	0	+	4	0	10	30
18	(7)	56	LL	LL	+	+	0	84	+	25	47
19	(8)	35	LL	LL	+	0	+	90	0	17	24
20	(11)	44	RU, RM	Right lung	+	0	0	4	+	11	24
21	(12)	32	RU, RM	Right lung	+	+	0	Not drained	+	..	Died
	Totals				9	4	3	232	6	144	225
	Averages							38.7		24	37.5

TABLE 2.—*Pulmonary Tuberculosis*

Case No.	Paired with Case No.	Age	Lobe(s) Involved	Lobe(s) Removed	Empyema	Wound Infection	Bronchopleural Fistula	In Terms of Postoperative Days: Drainage Tube Removed	Required Secondary Thoracotomy	Allowed Out of Bed	Discharged
Penicillin Series											
22	(29)	40	RU, RM, LU	RU, RM	+**	0	+	Not drained	+**	12	25
23	(30)	41	LU	LU	+**	0	+	Not drained	+**	26	48
24	(31)	25	RU	RU	0	0	0	2	0	5	14
25	(33)	26	RU, RM, RL	Right lung	0	0	0	Not drained	0	10	37
26	(34)	28	LU, LL	Left lung	0	0	0	6	0	8	18
27	Not paired	52	RU, RM, RL	Right lung	0	0	0	5	0	9	33
28	Not paired	58	RM	Right lung	0	0	0	3	0	8	14
	Totals				2+**	0	2**	16	2**	78	189
	Averages							4		11.1	27
Control Series											
29	(22)	23	LU, RU, RM	RU, RM	0	0	0	3	0	8	14
30	(23)	30	RU, RM	RU, RM (partial)	0	0	0	Not drained	0	17	24
31	(24)	35	LU, RU	LU	+	+	+	Not drained	+	44	112
32	Not paired	47	LU	LU	0	0	0	Not drained	0	13	19
33	(25)	27	LU, LL	Left lung	0	0	0	Not drained	0	15	28
34	(26)	33	RU, RM, RL, LL	Right lung	+	0	0	4	0	12	33
35	Not paired	30	LU, LL, RU	Left lung	+**	+	+**	Not drained	+**	..	Died**
36	Not paired	15	LU, LL	Left lung	0	0	0	3	0	9	18
	Totals				3	2	2	10	2	118	248
	Averages							3.3		16.9	35.4

* Spontaneous rupture. ** Tuberculous.

EMPYEMA CASES

Control patients who developed empyema were treated with penicillin. Treatment varied in these patients as to the dosage and route of administration. Patients 17 and 31 received only local therapy. Both had sterile fluid soon after treatment was instituted. In case 17 the clinical response was prompt. Both patients later developed bronchopleural fistulas. The local doses given were 20,000 units and 25,000 units respectively at frequent instillations. The empyema in case 31 was produced by Staphylococcus albus while the other infection was due to a nonhemolytic streptococcus.

Three patients were given only systemic therapy, 2 of whom, 13 and 35, received a continuous intravenous infusion of 100,000 units daily. Both had pneumococcic empyema and died in spite of penicillin therapy. Patient 35 was later shown to have a tuberculous empyema. The third patient, number 16, was also given 100,000 units daily, but by intramuscular injection. The infecting organisms were hemolytic streptococci and coagulase negative staphylococci. Response to treatment was prompt.

Seven of the infected control patients received both systemic and local therapy. Five of the 7 received 100,000 units daily systemically while the other 2 received 67,000 units and 50,000 units respectively. Local therapy in these 7 cases varied from 8,000 to 50,000 units daily, the smaller dose being used in case 19. Of the remaining 6, 3 received, locally, approximately 25,000 units per day, 1 received 40,000 units daily and 2 received 50,000 units daily.

Two patients (20 and 24) who received local and systemic therapy had a prompt response. Patient 20 was infected with anaerobic hemolytic streptococci. He was discharged after his empyema had responded to therapy, only to be readmitted a month later with a recrudescence of his infection which necessitated thoracotomy. The empyema in case 34 was produced by nonpathogenic staphylococci. Recovery was rapid.

Three infected patients, 15, 18 and 19, seemed to improve slightly with the use of combined systemic and local treatment. This response was purely clinical in 15 and 18, consisting of a decrease in toxicity. All 3 are still draining at 56, 101 and 102 postoperative days respectively. Patient 19 developed a bronchopleural fistula. He was originally infected with hemolytic streptococci, but this organism disappeared soon after penicillin therapy was instituted. Although still draining, the patient has been discharged. Patient 15 is infected with microaerophilic nonhemolytic streptococci which have been repeatedly recovered from his drainage. The empyema in case 18 contained a mixed flora including Hemophilus influenzae, nonhemolytic Staphylococcus aureus and Bacillus pyocyaneus. After penicillin had been given a thorough trial it was stopped. A type XXII pneumococcus then made its appearance in the drainage and remained present until the time of discharge. The empyema in this case first became evident with a severe wound infection. The infection in the chest was loculated and necessitated surgical drainage. The patient was discharged on his forty-eighth postoperative day only to be readmitted seventeen days later because of chronic cough and continued drainage.

Patients 14 and 21 died in spite of local and systemic therapy. Both had hemolytic streptococci as well as other organisms in the chest fluid.

No additional penicillin therapy was given to the 2 treated patients who developed late tuberculous empyemas. Both received the full twenty-one day course of prophylactic therapy.

In the presence of a bronchopleural-cutaneous fistula the value of penicillin in the treatment of empyema was reduced. This was due to constant recontamination and the inability to prevent the drug from leaking out of the infected space through the open bronchus or drainage tract. The bronchus of 1 of the infected control patients opened after complete wound healing had taken place, with a resultant pocket of infection about the bronchus. Local penicillin was given by bronchoscopic instillation through the open bronchus into the infected cavity with considerable success.

Of the 4 patients who died subsequent to pyogenic empyema patient 21 developed a massive streptococcic mediastinitis and patient 13 succumbed following an overwhelming pneumococcic empyema. Patient 35 died as a result of tuberculous and pneumococcic empyema, mediastinitis, pericarditis and wound infection. Patient 14 died suddenly following uncontrollable hemorrhage into the wound, which had become grossly infected.

TABLE 3.—*Lung Tumors*

Case No.	Paired with Case No.	Age	Lobe(s) Involved	Lobe(s) Removed	In Terms of Postoperative Days: Empyema	Wound Infection	Bronchopleural Fistula	Drainage Tube Removed	Required Secondary Thoracotomy	Allowed Out of Bed	Discharged
Penicillin Series											
37	Not paired	53	LU	LU (partial)	0	0	0	5	0	7	18
38	(39)	26	LU	Left lung	0	0	0	2	0	8	17
	Totals				0	0	0	7	0	15	35
	Averages							3.5		7.5	17.5
Control Series											
39	(38)	29	RU	Right lung	0	0	0	2	0	7	19
40	Not paired	44	LU, LL	Left lung	0	0	0	Not drained	0	8	15
41	Not paired	43	LU, LL	Left lung	0	0	0	Not drained	0	11	41
	Totals				0	0	0	2	0	26	75
	Averages							2		8.7	25

DEATHS OF NONINFECTED PATIENTS

Seven patients died postoperatively after lung resection without evidence of infection. Six of these had removal of an entire lung and 1 a right upper lobe lobectomy. The single lobectomy was performed on a white man aged 49 with multiple abscesses of the right upper lobe. He was considered as a control and did not receive penicillin at any time. His postoperative course was uneventful for three days. On the third day after eating his dinner he died very suddenly. No autopsy was obtained.

Of the 6 patients who died following pneumonectomy, 1 was a white woman aged 28 with extensive caseating tuberculosis of the right lung accompanied by bronchial stenosis. This patient received penicillin before and

after operation. Following pneumonectomy x-ray showed a wide contralateral spread. Her course was progressively downhill until she died in great respiratory difficulty on the sixth postoperative day.

The 5 remaining patients had resection because of bronchogenic carcinoma. All 5 were included in the penicillin prophylaxis series. Death occurred in all instances within four days postoperatively. Autopsy was performed on 3 of these patients. Postmortem examination was not permitted on the other 2, 1 of whom developed a left sided hemiplegia about twelve hours before death. The consensus was that he had a cerebral embolus. The other patient, on whom autopsy was not performed, died approximately eight hours after pneumonectomy. He suddenly became very pale, gasped a few times for breath and died. During this episode his blood pressure could not be obtained. It is believed that the patient died from hemorrhage into the chest.

Among the 3 patients on whom autopsy was performed, 1 was a man aged 61 who developed a hacking, nonproductive, continuous cough soon after operation. He was quite exhausted at the end of seventy-two hours and died as a result of acute myocardial failure. Autopsy revealed pulmonary congestion and emphysema of the remaining lung. It is of interest that an acute fibrinous pericarditis was found at autopsy, culture of which was sterile. Another patient, a white man aged 22, died following pneumonectomy. Autopsy revealed no metastasis of the bronchogenic carcinoma but acute passive congestion and pneumonitis of the remaining lung. There was evidence of pronounced cardiac dilatation and cardiac insufficiency. Because of a severe anemia the patient received 3,000 cc. of whole blood during the preoperative and operative period. This may have predisposed to the development of pulmonary edema.

The last of these patients was referred to previously, since he received penicillin and showed evidence of infection. This patient was a white man aged 53 who had a rather complicated course. The surgeon in this case elected to perform a two stage procedure. At the first operation he determined the resectability of the lung and ligated the bronchus. Two weeks later pneumonectomy was performed. The patient was given penicillin for seven days before the second stage procedure. At the time of resection it was discovered that the bronchus had perforated at the site of the ligature with a resultant collection of pus lying about it. This pus produced the same pneumococcus, type III, which had been present in the sputum for several weeks. Immediately after pneumonectomy the patient had a relatively uneventful course except for evidence of positive pressure at one time. On the second postoperative day, while drinking milk, he choked, became unconscious and died rather suddenly in respiratory distress. Postmortem examination revealed a positive pressure pneumothorax on the left side but no demonstrable leak in the bronchus stump. The stomach, trachea and bronchus contained milk. The right lower lobe was atelectatic, the middle lobe was partially atelectatic. The upper lobe was emphysematous and showed congestion. There was no evidence of neoplastic metastasis or infection. This case is excluded from the analysis of results for the following reasons. Since the first stage of this procedure was done without benefit of the drug and the second was done under penicillin prophylaxis, it is difficult to classify this patient as experimental or control. It is impossible to determine whether the perforation and subsequent infection took place during the week following bronchial ligation when penicillin was not given or during the week of therapy prior to pneumonectomy. If the perforation and infection took place before the drug was given it is unlikely, in view of our experience in the treatment of postoperative empyema, that the systemic administration of penicillin would eliminate the type III pneumococcus from this localized infection in the presence of an open bronchus. Sputum cultures, which revealed this organism on nine occasions from 14 specimens obtained prior to therapy, showed the disappearance of the pneumococcus from the sputum after three days of penicillin administration. This is in keeping with the absence of evidence of infection at autopsy, which suggests that penicillin was effective in controlling the infection after the bronchus was closed and the lung was removed. There is nothing to suggest, either from the clinical course or from the autopsy findings, that the infection played any significant part in the patient's demise.

It is remarkable that among 22 pneumonectomies there were eight deaths, three of which were due to infection and five showed no evidence of infection. The 5 noninfected patients had been included in a group of 6, all of whom had bronchogenic carcinoma. All 5 had received penicillin before and after operation. Three patients with carcinoma serving as control pneumonectomies had no infectious complications and all survived. These figures seem to indicate that the use of penicillin may predispose to postoperative death following lung resection for pulmonary cancer. However, the lack of conformity of autopsy reports and clinical findings prior to death seems to make this most unlikely. The distribution of the fatalities is probably fortuitous.

BACTERIOLOGIC STUDIES

Unfortunately facilities did not permit a complete bacteriologic survey in every instance; however, many of the patients were studied sufficiently to permit some interesting observations and conclusions.

Initially it was our plan to evaluate the effect of penicillin on aerobic and anaerobic sputum flora, since this presented a simple procedure with readily accessible material. We also contemplated following the number of organisms per cubic centimeter of sputum. This, however, was soon abandoned, since the figures varied so widely and followed no definite trends.

Later it appeared that cultures of bronchial secretions obtained by bronchoscopic aspiration were of greater value than sputum cultures, since this excluded many of the common mouth organisms. Frequent bronchoscopic specimens were therefore obtained to supplement the sputum studies in one institution. Still later in the study, bronchus biopsy or bronchus swab cultures were obtained from the pathologic specimens as soon as they were removed from the chest. These were usually dropped directly into culture mediums.

Frequent cultures were made of chest fluid. This was especially interesting in the infected control cases in which penicillin was given.

RESULTS

Sputum exhibited a highly diversified flora, usually containing mouth organisms such as alpha streptococci, gram negative diplococci, pneumococci and diphtheroids. The penicillin given in experimental cases for seven days before operation exhibited only one consistent bacteriologic effect. Hemolytic streptococci disappeared from the sputum soon after therapy was instituted in

6 cases. Pneumococci and staphylococci were usually unaffected by the systemically administered penicillin, although in an occasional case these organisms disappeared from the sputum. Gram negative bacilli occurred frequently and often persisted throughout the period of hospitalization. Hemophilus influenzae was most conspicuous among these.

Bronchus biopsy cultures were obtained in 14 cases. Six of these showed no growth and included specimens not placed directly into culture mediums.

In 9 of the patients who developed empyema we had recovered preoperatively, from either sputum or bronchial secretions, thirteen of the causative or saprophytic organisms. Of the thirteen organisms thus traced between the sputum or bronchoscopic specimens and empyema fluid, seven made an intermediary appearance in bronchus stump cultures. The thirteen organisms thus traced included aerobic and anaerobic hemolytic and nonhemolytic streptococci, pneumococci, nonpathogenic staphylococci, Hemophilus influenzae and Bacteroides.

Chest fluid for culture was obtained both from tube drainage and by needle aspiration. Cultures obtained from drainage tubes were not considered reliable enough to contribute to the diagnosis of empyema unless there were copious amounts of purulent material, obviously draining from the pleural space. However, tube cultures afforded a ready means of following empyema flora. The appearance of contaminants such as proteus and pyocyaneus was common in these cultures. Many of the specimens obtained by tube drainage were sterile, especially those obtained soon after operation. Fluid aspirated by thoracentesis produced viable organisms in several instances in which the fluid was not purulent and did not become so. We did not consider these patients infected merely on the basis of the presence of organisms, whether in treated or in nontreated patients. We were often able to demonstrate that these organisms were the same as those obtained previously from sputum, bronchial secretions or stump biopsy cultures.

Patients who developed empyema, according to the criteria set forth, were given penicillin therapy. As discussed previously, dosage and route of administration of the drug varied. Response to therapy was by no means constant from either clinical or bacteriologic points of view. From the 12 patients with pyogenic empyema 28 organisms were obtained by culture of chest fluid. These organisms were distributed as follows: 8 streptococci, 5 of which were hemolytic; 6 strains of staphylococci, only 1 of which was hemolytic and pathogenic (determined by coagulase test); 4 pneumococci; 1 tubercle bacillus; 2 Bacteroides, and 7 gram negative bacilli. Of the gram positive organisms, anaerobic streptococci and pneumococci appeared most resistant to the penicillin therapy. Patients without fistulas demonstrating an empyema produced by staphylococci or aerobic hemolytic streptococci appeared to respond most promptly. Patients who developed fistulas demonstrated a great variety of organisms in their chest fluid.

It was noted that in several instances certain organisms disappeared from the sputum postoperatively in control cases.

PENICILLIN CONCENTRATIONS

The postoperative chest fluid of 4 patients has been tested for the presence of penicillin with negative results, except in 1 instance, in which blood was obtained on aspiration. This specimen clotted on standing and showed a concentration similar to that found in blood. The patients whose fluid was assayed were receiving only intramuscular therapy. The absence of the drug in chest fluid makes it difficult to understand the mechanism of the protection obtained from systemically administered penicillin. This is especially true in 1 case in which there was an obvious spill into the pleural space at operation of approximately 1 ounce (30 cc.) of pus, which contained hemolytic streptococci. The bronchial secretions of 2 patients were tested for the presence of penicillin. No drug was detectable in either.

Blood samples taken on 4 patients receiving 150,000 units of penicillin daily revealed concentrations varying from 0.030 unit per cubic centimeter to 0.36 unit per cubic centimeter, depending on the method of analysis and the time at which the specimen was obtained in relation to the cycle of injection, absorption and excretion. Apparently the administration of 12,500 units of penicillin every two hours maintains a detectable penicillin concentration in the blood serum.

COMMENT

Originally it was our plan to gather 50 treated cases and 50 control cases, feeling that this number would be required in order to establish the value of penicillin in preventing postoperative infectious complications after lobectomy and pneumonectomy. However, 41 experimental and control cases so clearly demonstrate the effect of penicillin that we do not feel that it is justifiable to continue the use of controls. The frequency of hemolytic streptococcus empyema in control cases probably accounts for much of the success obtained with the use of sulfonamides in recent years.

The fact that we have been able to pair 30 of the 41 patients satisfactorily plus the fact that the results in paired cases are not significantly different from those of the aggregates substantiates the validity of the conclusions drawn from this study. Most of the patients were in uniformly good condition when subjected to surgery, which eliminated certain other variable factors.

The occurrence of postoperative empyema in all control lobectomy and pneumonectomy, bronchiectatic and lung abscess cases is very striking when compared with the absence of postoperative infection in those receiving penicillin. Among the 20 control cases the incidence of empyema was 100 per cent in suppurative pulmonary infections, 37.5 per cent in pulmonary tuberculosis and zero in the bronchiogenic carcinoma group. It thus appears that penicillin prophylaxis will have its greatest usefulness in those cases in which there is pyogenic pulmonary suppuration.

In comparing noninfected treated patients and noninfected controls, no appreciable differences are noted as to the number of days of tube drainage, the postoperative day out of bed and the postoperative day of discharge. This demonstrates the limitation of the usefulness of penicillin to the prevention of infectious complications following lung resection for suppurative lesions of the lung. There was no evidence that penicillin was of value beyond this limitation.

It is our opinion that the preoperative administration of penicillin has been a most important feature of this study. The drug given during this period probably serves to control acute and chronic infection in the pulmonary tissues, which reduces the possibilities of postoperative infections. In addition, the preoperative use of penicillin affords maximum therapeutic effect at the time the pleural space is exposed to bronchial contamination. We also feel that it is essential to administer an effective therapeutic dose of penicillin, given at fre-

quent intervals by a route of administration which offers technical simplicity and adequate absorption.

The routine use of local penicillin therapy applied directly into the pleural space after lung resection admittedly offers attractive theoretical possibilities. In this study we have avoided this method of prophylactic administration since it would constitute another variable factor and make it impossible to separate the effects of systemic and local therapy. It appears that systemic therapy is adequate; however, local therapy may offer an additional mechanism of protection.

SUMMARY

1. Penicillin administered for one week preoperatively and two weeks postoperatively in doses of 150,000 units daily given by intramuscular injection appears to be useful in preventing postoperative pyogenic infections following lobectomy or pneumonectomy.

2. Patients with bronchiectasis or multiple lung abscesses who received prophylactic penicillin and were subjected to partial or total lung resection showed no evidence of postoperative infection, had less fever, had fewer days of tube drainage, were allowed out of bed earlier and were discharged sooner than control patients, all of whom became infected.

3. Penicillin is apparently of no value in preventing or controlling tuberculous infections.

4. Penicillin administered systemically and locally was of variable value in treating postoperative suppurative infections which developed in control cases.

5. No toxic reactions have been noted in 41 patients who received a full course of penicillin therapy.

6. In patients who developed empyema the etiologic organism was often recovered from the sputum and bronchial secretions before operation and from bronchus stump cultures taken at the time of resection.[1]

PENICILLIN X

SUCCESSFUL TREATMENT OF GONORRHEA WITH A SINGLE INTRAMUSCULAR INJECTION

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In a recent issue of *Science* [1] it was reported that gonorrhea had been successfully treated with single injections of 100,000 units of commercial penicillin incorporated in a beeswax-peanut oil base. For the past several months we have had an opportunity to investigate the properties of so-called penicillin X,[2] sometimes referred to as factor X, or allopenicillin. This material was furnished to us by three manufacturers.[3] A small amount of crystalline penicillin X [4] was also made available to us.

When assayed by the cup-plate method [5] the potency of crystalline penicillin X is approximately 900 units per milligram, while crystalline penicillin [6] has a potency of 1,650 units per milligram. In addition, in vitro studies (serial dilution) show that penicillin X is more effective than commercial penicillin against a strain of Klebsiella pneumoniae type A and a strain of Bacillus cereus. No difference in effect could be shown between penicillin X and commercial penicillin on four strains of Staphylococcus aureus. However, preliminary studies indicate that penicillin X is three to five times more effective in protecting mice against 10,000 lethal doses of pneumococcus type I than commercial penicillin.

On the basis of the increased activity of this new preparation against certain organisms in comparison with commercial penicillin, it appeared desirable to determine the effect of penicillin X on the gonococcus. Accordingly, 68 patients with gonorrhea,[7] most of whom were sulfonamide resistant, were treated with a single intramuscular injection of 25,000 units of penicillin X. The group consisted of 35 males and 33 females. Our criterion of cure was three negative cultures obtained one, three and five days after treatment had been completed, although in some cases, because of menses or other factors, cultures were taken at greater intervals and over a longer period of time. Sixty-four patients, or approximately 94 per cent of those treated, were cured. For comparative purposes a group of 58 patients with gonorrhea (31 males and 27 females) were treated with a single intramuscular injection of 25,000 units of commercial penicillin. Using the same criterion, 37 patients, or approximately 64 per cent of those treated, were cured. It is of interest that 3 of the patients in whom we failed to obtain a cure with commercial penicillin were cured by a subsequent treatment with a single injection of 25,000 units of penicillin X.

Studies of the blood concentration were made on 7 patients treated with penicillin X and on 8 patients treated with commercial penicillin. These concentrations were determined with the serial dilution technic using Bacillus subtilis as the test organism, one-half hour, one hour and two hours following intramuscular injection. During the first two hours after treatment a consistently higher concentration of penicillin X was maintained in the blood. Urinary excretion studies were made over a period of eight hours on 9 patients, 4 treated with penicillin X and 5 with commercial penicillin. During the first two hour period 59 per cent of the penicillin X injected was excreted, as compared with 68 per cent of the commercial penicillin. After eight hours the total excretion of penicillin X was 71 per cent as compared with 80 per cent of commercial penicillin. Further studies are in progress using larger doses of penicillin X in a single intramuscular injection to determine its efficacy and rate of excretion at higher levels.

Although the number of cases reported here is small, if further work substantiates the fact that a large proportion of cases of gonorrhea can be cured with a single intramuscular injection of penicillin X, the public health control of this disease, which has been materially affected by the use of commercial penicillin, will be further facilitated.

1. Since this report was submitted for publication, 5 additional pneumonectomies have been performed in accordance with the procedure outlined in this study. All 5 patients received the prophylactic course of penicillin. Four of them were resected for bronchiogenic carcinoma and 1 for a bronchial adenoma. None of these patients became infected and all of them survived.

From the Food and Drug Administration, Federal Security Agency.

1. Romansky, M. J., and Rittman, G. E.: A Method of Prolonging the Action of Penicillin, Science **100**: 196, 1944.

2. Commercial penicillin and penicillin X in this article refer to the sodium salts of these substances.

3. Obtained through the courtesy of the Upjohn Company, Cutter Laboratories and Cheplin Biological Laboratories.

4. Robert D. Coghill of the Northern Regional Research Laboratory supplied the crystalline penicillin X.

5. Mimeograph: "Methods Used by the Food and Drug Administration for the Assay of Penicillin, January 1944."

6. Crystalline penicillin G prepared from commercial penicillin.

7. The clinical work in this study was done at the Rapid Treatment Center, Gallinger Municipal Hospital, Washington, D. C. Drs. Sidney Olansky, A. M. Gamboa and M. L. Cannon aided in these studies.

Clinical Notes, Suggestions and New Instruments

AN UNUSUAL CASE OF CUTANEOUS HODGKIN'S DISEASE WITH TERMINAL BLOOD STREAM SPREAD

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The patient who is the subject of this report was encountered in a study of 225 cases of Hodgkin's disease.[1] The unusual features of the case and the rarity of cutaneous Hodgkin's disease are deemed sufficient justification for the publication of this report.

History.—W. K., a white man aged 44, a World War I veteran, was admitted to the Edward Hines hospital on Nov. 4, 1940. His father died at 78 of "old age." His mother died of pneumonia at an age unknown. Two sisters died in infancy and 1 sister died at 21 of pneumonia. Two brothers, his wife and 2 children are alive and well. There was no history of diabetes, tuberculosis or carcinoma in the family. His occupation was that of an auto repairman and lately he held a job as a road tester. He had an appendectomy in 1918. There was no history of venereal diseases. He smoked ten cigarets a day and consumed 1 pint of whisky a week.

Fig. 1.—Microscopic appearance of section of one day old erythematous skin nodule from right abdominal wall, showing nothing more striking than some lymphocytes in the corium. Also a minimal endothelial and fibroblastic reaction about several blood vessels can be seen.

In March 1939 he first noted a lump on the midposterior aspect of the right calf. For a period of six months this lump gradually grew until it attained the size of a hen's egg. At this point the skin ulcerated and for several weeks there was drainage of a purulent exudate. Soon afterward several more lumps appeared under the skin of the surrounding region as well as on the opposite calf. These new lesions also became ulcerated. On Aug. 26, 1939 the patient presented himself to a private clinic, where a diagnosis of idiopathic multiple hemorrhagic sarcoma was made. This diagnosis was thought to have been confirmed by a skin biopsy. The biopsy slide was requested for review purposes but could not be obtained. While under the care of the private clinic the patient received irradiation to the skin lesions, all of which responded readily except for the one ulcer in the right popliteal space. This area received a total of 4,023 roentgens.

Early in September 1940 the patient began to experience severe chills approximately every six hours. These were followed by periods of profuse sweating and exhaustion. They were associated with a loss of appetite.

Examination.—On admission to this hospital the patient appeared well developed and well nourished but acutely ill. The temperature was 101 F., pulse rate 120 and respiratory rate 38. The skin was dry and had a suggestion of a yellow tinge. The pharynx was slightly injected. The gums were tender, with evidence of recent extraction of teeth. The submaxillary lymph nodes were slightly enlarged and firm. The chest and abdomen were negative to percussion and auscultation. The blood pressure registered 106/72. The skin of the left buttock presented multiple shallow ulcers which were more or less confluent, covering an area 10 cm. in diameter. The skin of the entire right popliteal space was similarly ulcerated. Many brown and grayish black spots were present on both legs.

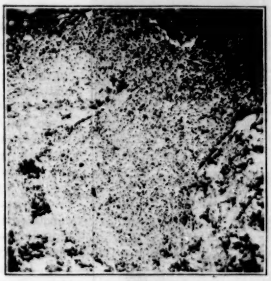

Fig. 2.—Microscopic appearance of section of older skin lesion. The typical Sternberg cells are evident in the corium.

The blood count showed hemoglobin 60 per cent, red blood cells 3,200,000 and white blood cells 9,200, with 79 per cent polymorphonuclears and 21 per cent lymphocytes. Blood Kahn and Wassermann reactions were negative. Urinalysis was negative. Blood culture was sterile on four examinations. Blood smear was negative for malarial parasites. The Widal test was negative. The agglutination test for undulant fever was negative. A roentgenogram of the chest was negative, except for elevation of the right dome of the diaphragm.

Course.—Three days after admission the patient developed several new skin lesions on his right flank. These at first manifested themselves as 0.5 cm. erythematous areas. The same day they grew to become slightly raised nodules in the skin. The following day one of these pinkish nodules was excised for biopsy. Microscopically it showed normal epidermis with a minimal reaction about several small blood vessels (fig. 1). The reaction consisted of slight endothelial and fibroblastic proliferation. A moderate number of lymphocytes were seen scattered in the corium. It is interesting to note that this skin nodule showed nothing more striking than some scattered lymphocytes, even though it was clinically a well developed erythematous nodule. The microscopic appearance of the specimen from the older and larger skin lesion was typical of Hodgkin's disease (fig. 2).

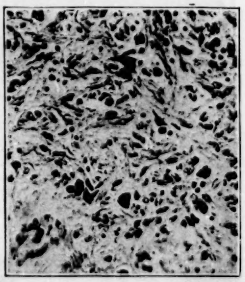

Fig. 3.—Microscopic appearance of section of a Hodgkin's nodule obtained at autopsy. This shows a moderate amount of fibrosis, many fibroblasts, only a moderate number of lymphocytes and many multinucleated hyperchromatic giant cells of the Sternberg type.

On the eighth hospital day the patient developed a sudden spread of the skin nodule. Literally hundreds of small circumscribed papular nodular erythematous lesions appeared in the skin from head to foot (figs. 4, 5 and 6). This was associated with severe chills and stupor. The temperature rose and stayed at 103-104 F. On the last day it reached 105.5 F. The patient died on Nov. 20, 1940, sixteen days after admission.

From the Tumor Service, Veterans Administration Facility, Hines, Ill.
Published with the permission of the Medical Director of the Veterans Administration, who assumes no responsibility for the opinions expressed or the conclusions drawn by the author.

1. Bersack, S. R.: Hodgkin's Disease: A Pathologic Classification, Am. J. Clin. Path. **13**: 253-259 (May) 1943.

Autopsy.—The body was 170 cm. in length and weighed 160 pounds (73 Kg.). The skin of the face and neck presented innumerable small (2 to 4 mm. in diameter) pink, slightly raised nodules. They could be felt throughout the scalp. Many nodules were also found in the skin of the back. A small number were present on the chest and abdomen and a few on the thighs. The skin of the arms presented a moderate number of flat grayish white round scars 5 mm. in diameter. No nodules were observed on the forearms, hands and feet. The dura had a few flat nodules. None could be found in the brain substance. Beneath the mucosa of the trachea, larynx, the laryngeal surface of the epiglottis, the esophagus and the stomach were many small pinkish nodules 2 to 3 mm. in diameter. The mucosa was not ulcerated. The nodules were fairly uniformly scattered, increasing in number as one proceeded downward.

Fig. 4.—Appearance of face in a case of cutaneous Hodgkin's disease with terminal blood stream spread.

Many minute nodules were also found in the parietal pleura, a small number in the lungs, an occasional nodule in the parietal peritoneum and several in the pericardium, spleen and both testes, as well as two minute gray spots on the cortical surface of the kidneys. The liver was studded with numerous small nodules. The mediastinal lymph nodes were small, soft and black. A moderate number of enlarged lymph nodes were found in the retroperitoneal region along the iliac vessels and in the capsule of the pancreas. The abdominal nodes measured 1 to 3 cm., the pelvic nodes up to 5 cm. Microscopically these nodules showed a moderate amount of fibrosis, many fibroblasts, a moderate number of lymphocytes and many multinucleated hyperchromatic giant cells of the Sternberg type (fig. 3).

Fig. 5.—Trunk of patient.

The autopsy diagnosis was Hodgkin's disease of the skin with metastases to the abdominal and pelvic lymph nodes, trachea, lungs, pleura, esophagus, stomach, liver, spleen and lumbar vertebrae.

COMMENT

The case of cutaneous Hodgkin's disease here reported illustrates a terminal spread through the blood stream. The fact that no malignant cell could be found in the microscopic examination of the early skin nodules caused by blood stream spread is in favor of a virus etiology of Hodgkin's disease. The hematogenous dissemination must have been mediated through the humoral content of the blood. The only alternative would be to incriminate the few lymphocytes found in the initial stage of a new focus. They might possibly be the vectors of the noxus. The theory of a virus etiology of Hodgkin's disease is an attractive one in that it will explain the early clinical features of an inflammatory nature and also the later development into a seemingly autonomous neoplastic disease. The virus theory deserves further clinical and experimental study. It may be worth while to attempt transmission experiments with blood derived from a patient who, as in the present instance, is exhibiting blood stream spread.

Fig. 6.—Literally hundreds of small circumscribed papular and nodular erythematous lesions covered the skin from head to foot.

SUMMARY

A patient with cutaneous Hodgkin's disease with rapid terminal blood stream spread presented the additional unusual feature of ulceration of Hodgkin's skin lesions.

The occurrence of terminal blood stream spread without any evidence of embolic cellular element dissemination is consistent with a virus etiology of Hodgkin's disease.

THE EFFECT OF STARVATION ON DIABETES INSIPIDUS

JOHN P. PETERS, M.D., NEW HAVEN, CONN.

It has recently been demonstrated by Winter, Sattler and Ingram [1] that the polyuria of experimental diabetes insipidus in animals is greatly reduced or eliminated by starvation. The following case illustrates the same phenomenon in a woman with diabetes insipidus complicated by vomiting of pregnancy:

M. H., a woman born Jan. 1, 1918, was admitted to the New Haven Hospital March 15, 1944 for pernicious vomiting of pregnancy. Her last menstrual period had been Dec. 31, 1943. She was reported to have been seriously ill with "acidosis" when 3 to 4 years old but knew no details of the illness. At 16 she was treated with injections for amenorrhea. At 18 she suffered for a full summer with intermittent attacks of headache and vomiting. She was, however, able to return to college in the fall and complete her course. Regular, spontaneous menstruation did not begin until she was 21 years old. She was married in February 1943. In addition to this she stated that as long as she could remember she had always imbibed enormous amounts of water, up to 7 or 8 quarts a day, but, because of a large bladder capacity, had never suffered undue inconvenience from urinary frequency.

She was small, well developed and moderately nourished, quite dehydrated, and weighed less than 90 pounds (41 Kg.). Her temperature was 100 F. by mouth, pulse rate 70, blood pressure 108/64. There was a slight exophoria of the right eye associated with a refractive error. The optic disk outlines were slightly blurred, especially along the nasal margins. The knee jerks were extremely hyperactive. Except for this and the signs of pregnancy physical examination was essentially normal. Blood count revealed 3 million red blood cells, 11 Gm. hemoglobin, and normal leukocytes and differential count. The Kahn test was negative. In spite of her dehydration the initial urine specimen had a specific gravity of only 1.004; otherwise it was negative. On March 21 the blood nonprotein nitrogen was 19 mg. per hundred cubic centimeters, serum carbon dioxide 23.0 milliequivalents per liter, chlorides 102.2, serum protein 5.89 per cent, albumin 3.98, globulin 1.91. X-ray films of the skull revealed no abnormalities.

Through March 17 she was permitted nothing by mouth, receiving moderate amounts of isotonic solution of sodium chloride and 5 per cent glucose by infusion. The vomiting ceased and the urine volume was moderate. On the 18th she vomited when attempts at feeding were resumed. For this reason food and fluids were again stopped and she was given on the 19th an infusion of 2,500 cc. of isotonic sodium chloride and glucose solution. On this day, when she received in addition to the infusion only 270 cc. of fluid by mouth, she voided 5,750 cc. of urine, 3,500 cc. during the four hours that the infusion was running. On the 20th and 21st, when she took and retained small amounts of food, the urine volume was 3,550 and 3,200 cc. respectively, with obvious fluid intakes of 2,000 and 2,750 cc. In spite of extreme restriction of salt, as vomiting remained in abeyance and the food intake increased, the urine volume rose steadily to reach 5,550 cc. on March 28 with an obvious fluid intake of 4,350 cc. Attempts to control the diuresis with injections of pitressin or nasal insufflation of posterior pituitary powder were thwarted by abdominal cramps and vomiting which these medications induced. Moreover, as her diet increased her fluid intake rose out of proportion. This forced her to drink more than her stomach could tolerate and provoked a recurrence of vomiting on a profuse scale.

The pregnancy was terminated operatively on March 3. On this day and the next, when she received no food, the urine volume again fell to 2,000 cc. per day with intakes of 3,500 and 2,400 respectively. As diet was resumed it rose steadily to reach the magnificent figure of 8,550 cc. with an obvious fluid intake of 6,650 cc. By means of intranasal posterior pituitary powder, which she was now able to tolerate, it proved possible to reduce the urine volume below 4,000 cc. per day, which relieved her of all inconvenience.

When she was last seen on Sept. 26, 1944 she was subjectively in excellent health, weighing 110 pounds (50 Kg.). By using the pituitary powder two or three times a day she was able to avoid all inconvenience from the polyuria. Both thirst and frequency recurred, however, as soon as she discontinued the therapy. The urine specific gravity was 1.005.

This appears to be an authentic case of diabetes insipidus in which the polyuria was suppressed by starvation, in this instance occasioned by vomiting of pregnancy. The reaction to infusion also illustrated dramatically the diuretic influence of salt in this condition.

From the Department of Internal Medicine, Yale University School of Medicine, and the New Haven Hospital.

1. Winter, C. A.; Sattler, D. G., and Ingram, W. R.: The Relationship Between Salt Intake and the Polyuria of Experimental Diabetes Insipidus, Am. J. Physiol. **131**: 363 (Dec.) 1940.

AGRANULOCYTOSIS TREATED WITH PENICILLIN

LIEUTENANT COLONEL LESLIE B. SMITH, MAJOR FRANK COHEN AND CAPTAIN RALPH G. NICHOLS
MEDICAL CORPS, ARMY OF THE UNITED STATES

Spontaneous leukocytic regeneration has been reported [1] to occur in cases of agranulocytosis when the primary or secondary infections were controlled by specific chemotherapy (sulfonamide).

We believe that the reporting of 2 cases of agranulocytosis successfully treated with penicillin is timely. To date 1 such case has been cited; [2] however, there have been none reported in detail.[3]

REPORT OF CASES

CASE 1.—A Negro aged 18 years was admitted to the Station Hospital, Camp Wolters, Texas, Feb. 28, 1944 complaining of sore throat, fever, cough and pain in his chest.

The history revealed that he had had measles and mumps as a child and "malaria" eighteen months before admission without recurrence. Although he denied having had a penile lesion or other manifestations of syphilis, the syphilitic register revealed that the Kline test had twice been positive in November 1943, that the Kahn and Wassermann tests were positive in January 1944 and that the spinal fluid was normal. The diagnosis was late latent syphilis, for which he had been given seven doses of 0.06 Gm. of mapharsen and four doses of 0.2 Gm. of bismuth subsalicylate during the four weeks preceding this admission. He had had a sore throat and fever for a day following the fourth and fifth doses of mapharsen. These symptoms recurred one day after the seventh dose of mapharsen and became so severe that he was admitted to the hospital three days later.

At the time of admission he was acutely ill. The temperature was 100.4 F., the pulse rate was 98 per minute and the respiratory rate was 22 per minute. The tonsils, oral pharynx and nasal membranes were hyperemic and edematous. The anterior and posterior cervical lymph glands were slightly enlarged and tender, and there were a few coarse rales in the bases of both lungs. The remainder of the physical findings were normal. He was given symptomatic treatment, acetylsalicylic acid and saline gargles during the first twenty-four hours of observation.

The second day he appeared to be critically ill. His temperature had gradually increased to 104 F. and the leukocyte count was 5,390 per cubic millimeter. The first differential blood count, done during the morning of the second day, revealed 0 per cent neutrophils, 95 per cent lymphocytes, 3 per cent monocytes and 2 per cent eosinophils. A second blood study, made seven hours after the first, revealed 4,000 leukocytes per cubic millimeter, with 1 per cent stab forms and again 0 per cent segmented neutrophilic polymorphonuclear cells. The erythrocyte count was 4,200,000 and the hemoglobin was 80 per cent. Heterophile agglutins were not present in the blood.

1. Dameshek, W., and Wolfson, L. E.: A Preliminary Report on the Treatment of Agranulocytosis with Sulfathiazole, Am. J. M. Sc. **203**: 819-823 (June) 1942. Nixon, N.; Eckert, J. F., and Holmes, K. B.: The Treatment of Agranulocytosis with Sulfadiazine, Am. J. M. Sc. **206**: 713-722 (Dec.) 1943.

2. Keefer, C. S., and others: Penicillin in the Treatment of Infections: Statement by the Committee on Chemotherapeutic and Other Agents, Division of Medical Sciences, National Research Council, J. A. M. A. **122**: 1217-1224 (Aug. 26) 1943.

3. Keefer, C. S.: Personal communication to the authors, April 1944.

Three blood cultures were subsequently reported as showing no growth. A roentgenogram of his chest was essentially normal. A diagnosis of agranulocytosis was made.

On the third day a small shallow ulcer, containing a necrotic exudate, was present on the surface of the right tonsil. Bacteriologic studies of specimens obtained from the ulcer showed mixed organisms and hemolytic streptococci. A differential blood count showed only 1.5 per cent stab forms and 0.5 per cent segmented neutrophilic polymorphonuclear cells.

Penicillin therapy was begun at 4 p. m. the third day in doses of 20,000 Oxford units, intramuscularly, every three hours. Sixteen hours after the first dose the temperature was normal, general improvement was definite and the ulcer in the right tonsil was clean and much smaller. At this time the leukocyte count was 4,500 per cubic millimeter and the differential count was 37 per cent neutrophilic polymorphonuclear cells, 5 per cent eosinophils, 3 per cent monocytes and 55 per cent lymphocytes. The neutrophilic polymorphonuclear cells were divided as follows: 19 per cent segmented, 10 per cent stabs, 7 per cent juveniles and 1 per cent myelocytes.

Although the patient was definitely clinically improved and a differential blood count revealed 50 per cent neutrophils, the therapy was augmented on the fourth day by pentose nucleotide (40 cc. daily) and yellow bone marrow (twelve granules each day).

Convalescence continued to be uneventful. The dosage of penicillin, the leukocytic response and the temperatures are given in chart 1. Continued observations for four weeks revealed that he remained well, that the blood count was normal and that heterophile agglutins were not present in the blood.

This patient was given three small blood transfusions, pentose nucleotide and bone marrow; however, the dramatic improvement was concurrent with the administration of the penicillin and preceded the pentose nucleotide therapy.

Case 2.—A Negro aged 31, well nourished, was admitted to the Station Hospital, Camp Wolters, Texas, March 13, 1944 complaining of sore throat and painful swollen gums.

He gave a history of having had measles as a child, typhoid at the age of 20 and some treatment for syphilis ten years previously. The syphilitic register revealed that the Kahn and Wassermann reaction were positive in January and February 1944, that the spinal fluid was normal and that he had been given six 0.06 Gm. doses of mapharsen and three 0.2 Gm. doses of bismuth subsalicylate in the three week period preceding

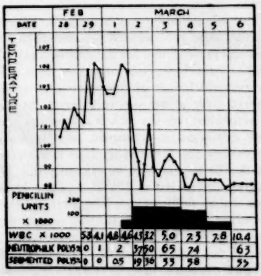

Chart 1.—Course in case 1.

this illness. He stated "Each arm shot made me quite sick in my stomach." He had a sudden onset of severe "sore throat" on March 9, the day following the seventh dose of mapharsen. His gums became sore, for which he was first seen in the Dental Clinic, March 13. A stained specimen from the lesions of the gums revealed numerous fusiform bacilli and the spirochete Borrelia vincenti. A diagnosis was made of moderately severe, acute ulcerative stomatitis due to Vincent's organisms, for which he was admitted to the hospital.

At the time of admission he was acutely ill, his temperature was 102.2 F. and the pulse rate was 110 per minute, his throat was hyperemic and there were moderate ulcerations of the gums about the lower left molars. These ulcers contained a necrotic exudate. Symptomatic treatment consisting of sodium perborate gargles and acetylsalicylic acid was given. The following morning the temperature was 103.2 F. The ulcerations were more extensive and he was critically ill. The leuko-

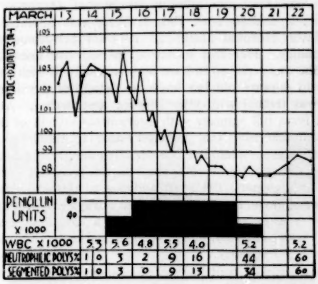

Chart 2.—Course in case 2.

cyte count was 5,370 per cubic millimeter, with 0 per cent neutrophilic polymorphonuclear cells, 74 per cent monocytes, 10 per cent large lymphocytes and 16 per cent small lymphocytes.[4] The hemoglobin was 75 per cent and there were 4,280,000 erythrocytes per cubic millimeter.

The third day the patient was very listless and apathetic. He could not take food or fluid by mouth. His temperature was 103.4 F. and the pulse rate was 112 per minute. The leukocyte count was 5,600 per cubic millimeter, with only 3 per cent granulocytes. Cultures of the mouth lesions revealed nonhemolytic staphylococci.

A diagnosis of agranulocytic angina was made, and penicillin therapy was begun in doses of 10,000 units intramuscularly every three hours. His temperature remained between 103 and 104 F. for twenty-four hours and then began to fall by lysis and was normal in thirty-eight hours. He was decidedly improved. The ulcers in the mouth healed rapidly and were absent by the sixth day of therapy. Granulocytes began to reappear in the blood on the second day of the penicillin therapy and continued to increase, as is shown in chart 2.

On March 22 the leukocyte count was 5,200 per cubic millimeter, with 60 per cent polymorphonuclear neutrophils, 18 per cent large lymphocytes, 5 per cent small lymphocytes, 15 per cent monocytes and 2 per cent eosinophils.

In addition to the 380,000 Oxford units of penicillin, this patient was given thirty capsules of yellow bone marrow and two transfusions of 250 cc. of citrated blood.

Convalescence was rapid and uneventful and he was discharged to duty thirteen days after his admission. Observations made during the next three weeks revealed that he remained well, blood counts were normal and heterophile agglutins were not present in the blood.

CONCLUSION

It is our opinion that the primary suppression of the bone marrow in these 2 cases was due to mapharsen, and that further suppression may have been caused by the secondary infection. The control of the secondary infection by penicillin therapy allowed spontaneous leukocytic regeneration to occur.

Although both of our patients received additional therapy, the striking improvements were observed to occur during the first twenty-four hours of the penicillin therapy. From the results obtained in these 2 cases we believe that further trial of penicillin in the treatment of agranulocytosis is indicated.

4. Differential blood stains have been reviewed by Cyrus C. Sturgis, M.D.

COMPRESSION FRACTURE RESULTING FROM ACCIDENTAL STIMULATION OF CAROTID SINUS

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An unfortunate complication resulting from a simple office procedure recently occurred in the orthopedic clinic of the AAF Regional Station Hospital, Langley Field, Virginia. The cause of the mishap provides interesting speculation and again indicates the seriousness of even the most casual routine office procedures. For these reasons a summary of the case history is presented.

Lieut. Col. J. B. S. reported to the orthopedic clinic because of intense pain and swelling of his right wrist present for three days following a flexion strain incurred during a volley ball game. Examination of the wrist revealed tenderness and swelling of the sheath of the extensor carpi radialis with crepitation on wrist flexion, increased local heat and intense pain on any motion. A diagnosis of traumatic tenosynovitis was made and plaster immobilization of the hand and forearm in a position of comfort was advised. No preliminary medication, injection or manipulation was performed. While sitting on an office stool, the patient was instructed to hold his hand in a comfortable position for the application of a light plaster cast over several layers of sheet wadding. During the application of the cast the patient complained of faintness, and his head slumped forward against his moderately tight neck band. Before the nurse could revive him with aromatic spirit of ammonia or loosen his collar band a strong convulsion gripped him, causing his back to flex sharply with all his flexors tightening in a tetanic spasm, which lasted for a few seconds. The convulsion was not unlike that which is induced in metrazol or insulin shock therapy. Unfortunately, neither the blood pressure nor the pulse was recorded during the excitement of the convulsion. He was immediately lifted from the stool and laid on the examining table, where he remained limp and unconscious for about five minutes. There was no loss of sphincter control. On recovery the patient immediately complained of terrific pains in the dorsolumbar spine, and subsequent x-ray films revealed compression fractures of the eleventh and twelfth dorsal vertebrae, resulting in about 25 per cent reduction in the width of the anterior portion of the bodies. The fractures were treated in the conventional manner, satisfactory reduction being obtained by the method of Davis, with the application of a hyperextension cast. The cast controlled his symptoms and he was able to resume his administrative duties within two months, his back supported by the body cast. The innocent appearing tenosynovitis disappeared after two weeks of plaster immobilization followed by a course of physical therapy.

In the absence of a history of similar attacks, it must be assumed that several factors contributed to the convulsion. The right carotid sinus was found to be hyperirritable, as subsequent pressure over the sinus produced dizziness and faintness. His normal fasting glucose level was 93 mg., although there was a normal response to the Extan and Rose sugar tolerance test. Since the accident occurred around 11 a. m. after the patient had foregone his breakfast, it was felt that his blood sugar at that time was abnormally low. Fatigue from several sleepless nights, apprehension over the original injury, pain in his wrist and the usual hospital aroma, added to the low glucose level, all helped to lower the threshold for stimulation of his normally hypersensitive carotid sinus. The pressure of a tight collar against his neck, which was acutely flexed by the weight of his unsupported head, had served as a trigger which precipitated his convulsion. Convulsions from pressure applied to a hyperirritable carotid sinus are rare but have been observed. To anticipate all these complicating factors before the application of a simple forearm cast would, of course, have been impossible. The unpredictable could easily have been prevented, however, if one simple precaution had been observed in the handling of the patient. This complication should help to emphasize again the danger inherent in any treatment given to a patient who is not in a horizontal position.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

CHORIONIC GONADOTROPIN (See New and Nonofficial Remedies, 1944, p. 445).

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'Lyovac' Chorionic Gonadotropin, 1,000 International Units: 10 cc. A powdered preparation which, when diluted with the accompanying 10 cc. of sterile distilled water containing 0.35 per cent of phenol, provides a solution having a potency of 100 international units per cubic centimeter.

'Lyovac' Chorionic Gonadotropin, 2,500 International Units: 5 cc. A powdered preparation which, when diluted with the accompanying 5 cc. of sterile distilled water containing 0.35 per cent of phenol, provides a solution having a potency of 500 international units per cubic centimeter.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 608).

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Ampuls Ouabain and Digitalis Tablets: 2 cc. Packages containing two 2 cc., 0.5 mg. ampuls of ouabain and one vial of 20 tablets digitalis 0.1 Gm.

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Tablets Aminophylline: 0.1 Gm.

TETANUS ANTITOXIN (See New and Nonofficial Remedies, 1944, p. 544).

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PITMAN-MOORE CO., INDIANAPOLIS

Tetanus Antitoxin Pepsin Digestion Refined: Vials containing 1,500 units.

ASCORBIC ACID (See New and Nonofficial Remedies, 1944, p. 620).

The following dosage form has been accepted:

CARROLL DUNHAM SMITH PHARMACAL CO., ORANGE, N. J.

Tablets Ascorbic Acid: 100 mg.

RIBOFLAVIN (See New and Nonofficial Remedies, 1944, p. 613).

The following dosage form has been accepted:

ENDO PRODUCTS, INC., RICHMOND HILL, N. Y.

Tablets Riboflavin: 5 mg.

PYRIDOXINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 618).

The following dosage form has been accepted:

MERCK & CO., INC., RAHWAY, N. J.

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SATURDAY, DECEMBER 16, 1944

STUDIES ON PINTO'S DISEASE

The discovery in Cuba in 1938 of the spirochetal etiology of Pinto's disease gave a new impetus to the study of the disease itself and also to that of yaws and syphilis. Within the last five years numerous reports have appeared concerning the occurrence of pinta in several countries in the American continent in which the condition had not been previously observed. With the publications of Fonso Gandolfo and his co-workers [1] in Argentina and the article of Lieberthal [2] in this country it would seem that the disease is prevalent in practically the whole American hemisphere. True only 3 patients have been studied by Lieberthal in Chicago, but, since 2 of them came from southern states near the heavily infected Mexico, it is highly probable that more cases will be diagnosed in the future. Although comprehensive reviews have already been published in English,[2] one must read the numerous original publications in Spanish to realize fully the painstaking efforts required for the solution of each of the problems posed by the disease in a long sequence of events that started hundreds of years ago.

The conquistadores, including Cortez himself, apparently observed Pinto's disease and wrote about it. Polanco in 1760 included pinta in his Diccionary. Berecochea and Corona in 1811 speak for the first time of the beneficial effects of mercury, and fifty years later J. J. Leon [3] gave the first clinical description of the disease, a study considered today as a classic. The effectiveness of arsphenamine was established in 1913 by Gratz in Bogota. Almost simultaneously but independently Menk in Colombia and González Herrejón in Mexico found in 1925 that the Wassermann reaction was positive in a high percentage of cases, and the following year González Herrejón [4] promulgated his thesis that pinta was a spirochetal disease different from yaws and syphilis. This conception was brilliantly confirmed in 1938 by a Cuban group, Alfonso Armenteros, Grau Triana, B. Sáenz, Pardo-Castello and León y Blanco, and by the subsequent studies of León y Blanco in Mexico. The mycosic theory currently accepted and sponsored by authorities such as Sabouraud was eliminated forever.

One also finds in the Spanish publications some refreshing anecdotes supplying the inside and humane part of the story. There was naive Father Alzate, who in 1759 thought that the disease was introduced in Michoacan as the result of a volcanic eruption, or the fantastic tales about men contracting pinta through sexual intercourse with some species of giant lizards; also the more realistic Bishop Fuero, who concretely blamed a woman from Chiapas for the spread of pinta—not a venereal disease though—throughout his diocese. We wonder about the power of deduction of J. J. Leon,[3] who in 1862 ascribed the disease to the ingestion of corn infected by a definite species of fungus, adding, however, that there was in the lesions a virus capable of transmitting the disease to other human beings through a vector insect. We enjoy reading about the innate wisdom of the Mexican Indians who got jobs in the mercury plants whenever affected by pinta and how this empirical observation suggested to Soberón y Parra [5] the use of arsphenamine and bismuth compounds for treating the disease.

Credit for the study of the early manifestations of pinta goes entirely to León y Blanco, who inoculated himself with infectious material and followed both clinically and bacteriologically the evolution of his lesion. Thus two important Latin American contributions to medicine, namely the final proof of the spirochetal etiology of pinta and that of the unity of Oroya fever and verruga peruana by Carrion in 1885 were the result of experiments on the experimenter himself. As it is well known, Carrión died the victim of his own scientific curiosity.

However, historical research by Aguirre Pequeño [6] has disclosed an observation by Iturbide in 1870 concerning a soldier who wounded himself with his bayonet after stabbing a person affected with pinta and contracted the disease himself. More important, though, are the studies that Telléz [7] described in his monograph. He stated that on numerous occasions he transmitted the disease to healthy persons by scarification with a lancet soiled with blood of pinta's patients, and he thought that insects of the genus Empis were vectors of the disease through the same way of transmission.

1. Fonso Gandolfo, C.; Steinberg, I. R.; Rugiero, H. R.; del Ponte, E.; Crivellari, C., and Coria, J. B.: Primer Congreso Nacional sobre Enfermedades Endemico-Epidemicas, Buenos Aires, 1942.
2. Lieberthal, E. P.: Pinta (mal del Pinto, Carate) in Continental United States, J. A. M. A. **123**: 619 (Nov. 6) 1943. Stokes, J. H.; Beerman, Herman, and Ingram, N. R.: Am. J. M. Sc. **205**: 611 (April) 1943. Fox, Howard: Chapter XXII in Clinical Tropical Medicine, Z. Taylor Berkovitz, editor, New York: Leon.
3. Leon, J. J.: Bol. Soc. Mex. de Geog. y Estadistics **8**: 503, 1860.
4. González Herrejón, S., and Pallares, M.: Hosp. gen. **2**: 109, 1927.
5. Soberón y Parra, G.: Avance med. **4**: 145, 1943.
6. Aguirre Pequeño, E.: Medicina **22**: 13, 1942.
7. Telléz, G.: El mal de Pinto, pamphlet, Mexico, 1889.

Telléz also stated that pinta was an exanthematic form of syphilis.

Contrasting with the wealth of information on the human disease naturally or experimentally induced, nothing as yet has been seriously done in attempting to reproduce the disease in animals. This situation should not last long, for one can easily visualize how fruitful it will be to have at one's disposal still another species of spirochetes, Treponema herrejoni or carateum, to carry out comparative studies with the other two species Treponema pertenue and Treponema pallidum. One can also foresee that the old debate on the European or American origin of syphilis will flare up again on the basis of the extremely probable fact that Pinto's disease was prevalent in America before Columbus.

It would be extremely useful if the excellent book by León y Blanco [8] could be translated into English, preferably in an enlarged and better illustrated edition.

HUMAN REQUIREMENT FOR THIAMINE

If the science of nutrition is to fulfil its destiny of service to man, the vast collection of fundamental data on experimental animals must be adapted to the needs of man without delay. Even before the Nutrition Conference in 1941, evidence with respect to dietary deficiencies in the nation had been secured. This information was amplified in quantity and implication [1] in 1943. Reliable data must be secured on human requirements for the various dietary essentials. The recommendations made by the Food and Nutrition Board of the National Research Council in 1941 have served as a useful guide in this respect. In the interim active investigation, particularly in the field of the vitamins, has continued in an effort to obtain more adequate criteria for detecting early deficiency states in man and also to improve the analytical methods involved.

Two summaries dealing with the human requirement for the antineuritic vitamin—thiamine, or vitamin B_1—have recently been published. Holt,[2] in considering the minimum thiamine intake required for the maintenance of health, points out that the composition of the diet affects the requirement of this vitamin. He evaluates the various criteria for adequacy—protection against beriberi, excretion of a definite portion of a test dose of the vitamin, control of the level of pyruvate in the blood, prevention of early accepted signs of deficiency—and concludes that under constant and close dietary control the minimum requirement for the normal human adult is between 0.13 and 0.17 mg. per thousand calories. With ordinary food consumption freedom from thiamine deficiency can be insured by 0.24 to 0.44 mg. per thousand calories. It is noted that age, pregnancy, sex and exercise do not materially alter this value for normal persons.

Essentially the same experimental evidence bearing on recent studies of the human requirement for vitamin B_1 has been surveyed by Melnick.[3] Various factors operate to give results which differ in the various studies; the nutritional status of the subjects prior to the test, the length of the experimental period and the criteria used for estimating the needs represent variations in technic which bear on the final conclusions. The minimum requirement for the sedentary adult is placed at 0.35 mg. per thousand calories. In view of the inevitable losses in cooking and of the uncertainties in absorption and utilization, Melnick considers the current recommendation of the National Research Council, 0.6 mg. per thousand calories, "as offering a liberal but necessary margin of safety."

The foregoing discussion calls attention to the complex problem presented by any attempt to evaluate exact human dietary requirements. Despite differences of interpretation of somewhat divergent results, it is clear that such progress has thus far been made as to elicit growing confidence in the estimates currently available.

Current Comment

EFFECT OF AMPHETAMINE SULFATE ON PHYSICAL AND PSYCHIC PERFORMANCE

In Alwall's experiments [1] large groups of soldiers were thoroughly fatigued by two or three nights of marching and exercises during the intervening one or two days, with little opportunity to sleep. In the course of the experiment the men marched 125 kilometers over a partly swampy ground with the temperature of the air being about 41 F. The men slept on an average three and one-fifth hours in the course of the entire experiment. On the termination of the fatigue exercises some of the men were given tablets containing 20 mg. of amphetamine sulfate, while others were given placebo tablets. Two and one-half hours later both groups were made to run 3 kilometers. Compared with the initial record established by the two groups just before they were subjected to the fatigue experiment, the postfatigue 3 kilometers run required 95 seconds more for the men given placebos and 18 seconds less for the men given amphetamine tablets. Seventy-one of the men in the amphetamine group of some 250 experienced unpleasant effects from the drug and these men gave a better performance. They were probably more susceptible to the drug, so that the administered dose was for them close to the upper therapeutic limit. The same dose of amphetamine administered after the fatigue period improved the rapidity of reading and

8. León y Blanco, F.: El mal de Pinto, Pinta o Carate, Monografías medicas "Balmis," Compañia General Editora, S. A. Mexico D. F., 1942.
1. National Research Council Bulletin 109, November 1943.
2. Holt, L. E., Jr.: Federation Proc. **3**: 171 (Sept.) 1944.
3. Melnick, Daniel: J. Am. Dietet. A. **20**: 516 (Sept.) 1944.
1. Alwall, Nils: Studien über die Einwirkung von Benzedrin und Pervitin auf die physische und psychische Leistungsfähigkeit hochgradig ermüdeter Menschen, Acta med. Scandinav. **114**: 33, 1943.

accuracy as determined by the Bourdon test. In persons who were not fatigued 20 mg. of amphetamine diminished the ability for solving arithmetical problems. This was particularly true for more difficult and complicated problems than for the easier problems. The same dose administered to fatigued persons at dawn improved the speed and decreased the error percentage in solving arithmetical problems. However, the same tests made in the afternoon no longer exerted a favorable effect, and Alwall believes this due to the fact that fatigue is greatest at about early dawn and decreases in the course of the day, even after a long lack of sleep. The impairment of performance by amphetamine in the daylight tests is not as pronounced in fatigued persons as in the nonfatigued. The condition of the person is important, therefore, in anticipating the amphetamine effect. The same dose may have a favorable effect on the performance under a certain set of conditions and an indifferent or unfavorable effect at another time or under different conditions. A favorable effect is to be expected in the presence of fatigue. The experiments on the effect of amphetamine on marksmanship in target practice in fatigued persons was indecisive but seemed to indicate that amphetamine rather impaired the accuracy of aim in good marksmen.

DIARRHEA AND BACILLARY DYSENTERY

The specific dysenteries and nonspecific diarrheas become a major problem in time of war. Military personnel are not alone involved, however; recently Sandweiss [1] reported observations on 250 civilian patients in Detroit, each of whom had experienced an attack of nausea, vomiting, abdominal cramps and diarrhea. He differentiates the patients into five clinical groups, depending on the severity and duration of their symptoms. Cultures of the stools of 190 of the patients were taken in order to determine whether identifiable pathogenic organisms were responsible for the gastrointestinal symptoms. Twenty-five different strains of paradysentery or Salmonella organisms were isolated in 68 cases. Twenty-seven of the patients were infected with two or three different organisms. Two of the patients died. The outbreak was mild in character, but many of the patients continued to harbor pathogens in their stools for months after the acute episode had subsided. These persons were consequently a hazard as carriers, particularly when employed in food establishments. Sandweiss employed phthalylsulfathiazole (sulfathalidine) for 33 carriers of dysentery organisms. The results were compared with a similar group of 39 patients not so treated. Unfortunately the drug did not appear to influence either the course of the illness or the carrier state, and the results were therefore not conclusive. Indeed, a higher proportion of patients who were treated with the sulfonamide continued as bacillary dysentery carriers than did the untreated patients. A comprehensive preventive program for bacillary dysentery is recommended. This should include the more rigid examination of food handlers with the addition of routine stool cultures and more frequent follow-up examinations of all carriers. In view of the addition to the population of returning military and civilian personnel, many of whom presumably will be carriers of bacillary dysentery, these recommendations for an intensified preventive program are particularly timely.

1. Sandweiss, David J.: Diarrhea and Bacillary Dysentery in Detroit, Clinics **3**: 553 (Oct.) 1944.

CHRONIC ILLNESS IN AN URBAN AREA

The Eastern Health District of Baltimore, which comprises two city wards containing about 11,000 white families and 2,800 colored households, was chosen for a five year survey of chronic illness.[1] This was considered reasonably representative of the type of locality in which an urban wage earning population lives. The following chronic diseases were included: manifest mental disorders, psychoneuroses, psychopathic and personality or behavior disorders; heart disease or hypertension; arthritis; diabetes; varicose veins; gallbladder disease; peptic ulcer; chronic nephritis; cancer; rheumatic fever; tuberculosis, and syphilis. Out of each thousand persons in the population of 5 years of age and older there were 32 cases of hypertension or heart disease, 18 cases of manifest and subclinical mental disorders, 16 cases of arthritis, 7 cases of rheumatic fever, 6 cases of diabetes and 11 cases of other chronic conditions. This resulted in a total prevalence of these chronic illnesses of 90 per thousand of population. Families chosen because of a case of chronic disease showed an excess rate of illness among its members as compared with the other family groups. The rate of physician visits for these patients with chronic disease was 2,375 per thousand of population, or slightly more than two visits per person annually. The rate of clinic visits was 1,517 per thousand, giving a total of about four visits per thousand annually. The same population group had an additional 2.5 visits per person for illness not related to the chronic disorder. Patients with chronic disease, therefore, had from three to four times as much medical care (measured by the number of visits from a physician!) as did the other members of their families and the general population studied. Persons in the 381 "chronic disease families" formed 26 per cent of the total observed population, had 54 per cent of the total illnesses and received about 50 per cent of the medical care for illness given to the total population. Persons from these few families also constituted almost 40 per cent of the persons hospitalized during the second year of the morbidity study. This interesting report again emphasizes the necessity for sound fundamental studies of the need for and cost of medical care in differently constituted groups. A large part of the medical care problem is the control of the housing, dietary and other environmental factors which affect the development of chronic disease. From the information presented it could be deduced that any plan to spread the cost of medical care over the entire population studied would mean that a comparatively small group and one perhaps especially liable to chronic illness would receive a disproportionate share of the benefits.

1. Downes, Jean.: Findings of the Study of Chronic Disease in the Eastern Health District of Baltimore, Milbank Memorial Fund Quart. **22**: 337 (Oct.) 1944.

MEDICINE AND THE WAR

NAVY

NAVY RESEARCH UNIT DEVELOPS NEW BLACKOUT TENT .

An emergency first aid and blackout tent, designed to permit physicians to work after dark in attack zones, was recently developed by the Navy's Medical Research Laboratory, Camp LeJeune, North Carolina. One tent will be issued to each battalion and regimental medical department and one to each medical company. The tent, which is made of neoprene coated balloon cloth, together with its four lines, weighs only 6 pounds 15 ounces and enables physicians to maintain blackout conditions when emergency operations must be performed. A flashlight can be used directly on the operative area, and additional light can be obtained by suspending another flashlight from the inside ties. Eight casualties, lying side by side on ponchos or blankets, can be sheltered by draping the tent over them. It will provide satisfactory conditions for examining casualties, securing hemostasis, dressing and redressing wounds, and administering plasma.

The Camp LeJeune Medical Field Research Laboratory has also developed a poleless field stretcher, made of nylon weighing less than 7 ounces, which can be carried in large quantities by combat units on extended forays, and an improved hospital corpsman's pouch. Both items will be placed in production soon.

NAVY AWARDS AND COMMENDATIONS

Lieutenant Samuel N. Etheredge Jr.

Lieut. Samuel N. Etheredge Jr., formerly of Norfolk, Va., was recently awarded the Bronze Star Medal. The citation accompanying the award read "For heroic achievement as medical officer attached to a Marine rifle battalion during an engagement with enemy Japanese forces at Piva Forks, Bougainville, Solomon Islands, on Nov. 24, 1943. Constantly subjecting himself to an intense barrage of hostile artillery and mortar fire, Lieutenant (then Lieutenant, junior grade) Etheredge fearlessly and courageously established and operated a battalion aid station during a devastating attack by our forces against a strong enemy position. Carrying out his perilous task with outstanding initiative and cool courage, he skilfully ministered to the injured throughout the fierce bombardment and, by his gallant devotion to duty, inspired his assistants to remain at their posts despite the extreme danger. Lieutenant Etheredge's outstanding professional ability and personal valor in the face of grave peril were in keeping with the highest traditions of the United States Naval Service." Dr. Etheredge graduated from the University of Virginia Department of Medicine, Charlottesville, in 1937 and entered the service Oct. 12, 1942.

Lieutenant (jg) Paul H. Koren

Lieut. Paul H. Koren, formerly of Scarsdale, N. Y., was recently awarded the Silver Star Medal. The citation read "For distinguishing himself by gallantry and intrepidity in action as a medical officer of a beach battalion in action against the enemy during the invasion of France, June 6, 1944. Lieutenant (junior grade) Koren engaged in rendering medical aid and attention to the wounded immediately on landing at the water's edge at H plus thirty-two minutes and continued this work, regardless of his personal safety throughout D day, exposed himself to the machine gun, rifle and artillery fire of the enemy and inspiring both wounded and unwounded men with confidence by his exemplary action. The conduct of Lieutenant (junior grade) Koren was in accord and keeping with the highest traditions of the United States Naval Service." Dr. Koren graduated from New York Medical College, Flower and Fifth Avenue Hospitals, New York, in 1942 and entered the service in June 1943.

ARMY

BRITISH PSYCHIATRIST INSPECTS ARMY FACILITIES HERE

Brigadier John R. Rees, consulting psychiatrist to the British army, now in this country as Salmon guest lecturer, visited the Office of the Surgeon General recently, where he conferred with the Neuropsychiatry Consultants Division and then inspected neuropsychiatric facilities at Crile General Hospital, Cleveland, and Winter General Hospital, Topeka, Kan. While in Kansas he also participated in the Undersecretary of War's Conference at Fort Leavenworth on "The Military Offender."

Brigadier Rees delivered the annual Thomas W. Salmon Lectures at the New York Academy of Medicine, November 20-22, and is now on a lecture tour as guest of the Salmon committee. The Salmon lectures were founded in honor of Col. Thomas W. Salmon, Medical Corps, who was chief of neuropsychiatry in the first world war.

ARMY MEDICAL CORPSMAN RECEIVES BRONZE STAR

Staff Sergeant Benjamin T. Mapes, formerly of New York, was recently awarded the Bronze Star Medal for meritorious achievement in connection with military operations against the enemy in the northern Solomon islands, July 28, 1943 to July 13, 1944. Sergeant Mapes had been a member of the staff of Willard State Hospital, New York, for sixteen years at the time of his enlistment in the fall of 1942. He was stationed at Fitzsimons General Hospital, Denver, before leaving the States two years ago.

ARMY AWARDS AND COMMENDATIONS

Captain William O. Finkelnburg

Capt. William O. Finkelnburg, formerly of Winona, Minn., was recently awarded the Bronze Star Medal for "Meritorious service against the Japanese forces at New Georgia, British Solomon Islands, July 31, 1943." Dr. Finkelnburg graduated from the University of Minnesota Medical School, Minneapolis, in 1942 and entered the service June 29, 1942.

Lieutenant Colonel Marion R. Mobley

Lieut. Col. Marion R. Mobley, formerly chief of the hard of hearing section of Deshon General Hospital, Butler, Pa., was recently commended for especially meritorious service by Major Gen. Philip Hayes, commanding general of the Third Service Command. The citation read "for exceptionally meritorious service from May 28, 1943 to July 27, 1944 as chief of the service for the rehabilitation of the hard of hearing established at Walter Reed General Hospital May 28, 1943 and transferred to Deshon General Hospital, Butler, Pa., Nov. 1, 1943. Noting the large number of deafened patients requiring treatment and appreciating the limitations of ordinary clinical facilities, Colonel Mobley, by his indefatigable energy, far sighted planning, continuous contact with prominent individuals and groups, military and civilian, and by designing clinic buildings and facilities, established an ideal program that has been copied in large part by other centers for the hard of hearing. He imbued all who worked with him with his enthusiasm and broad understanding.

As the program grew beyond all expectations, his health finally gave way. Even as a bed patient in the hospital he maintained close advisory contact with the program." Dr. Mobley graduated from the Medical College of the State of South Carolina, Charleston, in 1915, entered the service June 5, 1942 and retired from the Army in September 1944 because of a physical disability.

Captain Sion F. Sherrill

Capt. Sion F. Sherrill, formerly of Belle Fourche, S. D., was recently awarded the Bronze Star Medal for "meritorious services against the Japanese forces at Guadalcanal, British Solomon Islands, Jan. 19, 1943." Dr. Sherrill graduated from the University of Nebraska College of Medicine, Omaha, in 1931 and entered the service April 15, 1941.

Captain Brian J. Gallagher

The Silver Star was recently presented to Capt. Brian J. Gallagher, formerly of Bellerose, N. Y., for bravery and gallantry. The official citation read "For gallantry in action. On the 1st of April 1943, during the attack by the 3d Battalion, East of El Guettar, Tunisia, Captain Gallagher, while under constant observation by the enemy from high ground, personally supervised the evacuation of the wounded from the field of battle with utter disregard for his personal safety. Captain Gallagher was active on the front lines, aiding the wounded, and exposed himself time after time to enemy machine gun and artillery fire. By his bravery and untiring efforts he saved the lives of a great number of men and his example of steadfast adherence to duties was an inspiration to all men of his detachment." Dr. Gallagher graduated from Long Island College of Medicine, Brooklyn, in 1934 and entered the service in June 1942.

Captain Edward Y. Postma

Capt. Edward Y. Postma, formerly of Grand Rapids, Mich., has been awarded the Bronze Star Medal for meritorious achievement against the enemy. He is serving with the 106th Medical Battalion in the southwest Pacific. Dr. Postma graduated from the University of Michigan Medical School, Ann Arbor, in 1940 and entered the service in July 1942.

Captain Charles S. Becker

An award of the Bronze Star Medal was recently made to Capt. Charles S. Becker, formerly of Jamestown, N. Y. The citation reads "for meritorious achievement in connection with military operations against the enemy at Bougainville, Solomon Islands, April 6, 1944." Dr. Becker graduated from Western Reserve University School of Medicine, Cleveland, in 1942 and entered the service July 3, 1943.

MISCELLANEOUS

FOUR MEMBERS OF TYPHUS COMMISSION DECORATED

Award of the United States of America Typhus Commission Medal to four members of the commission was recently announced by the War Department as follows:

To Col. Harry A. Bishop, Medical Corps, Medical Section, Headquarters Mediterranean Base Section:

"For exceptionally meritorious conduct in the performance of outstanding services from Dec. 28, 1943 to Feb. 19, 1944 at Naples, Italy. Colonel Bishop was placed on duty with the American Typhus Commission at Naples at the height of a typhus epidemic in that city. As coordinating and executive head of its program he directed the training of military and civilian personnel in typhus control, their organization into effectual teams, and the securing of needed equipment and supplies. The efficient manner in which this task was accomplished despite the lack of trained personnel and adequate supplies is reflected by the rapidity with which the disease was brought under control. By his forceful leadership and application to duty Colonel Bishop aided materially in alleviating suffering and preventing what might have become a major catastrophe."

To Capt. Edward Harvey Cushing, Medical Corps, United States Naval Reserve:

"For meritorious service in connection with the work of the United States of America Typhus Commission. On Captain Cushing, the first executive officer of the commission, fell the responsibilities of administering and directing the work of the commission in the early months of 1943, when the director was invalided as a result of illness. To the contribution which Captain Cushing had made to the planning of the first overseas expedition of the United States of America Typhus Commission he added personal service of high order in his forceful and tactful administration of the activities of the commission during a difficult period at its first station in the Middle East."

To Dr. Alexander G. Gilliam, senior surgeon, United States Public Health Service:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. During the first half of 1943 Dr. Gilliam conducted surveys of typhus fever in Egypt and in Tripoli and made the first field investigations of the efficacy of typhus vaccine among native Egyptians. During the latter part of 1943 he made surveys of typhus fever in India and in China. While engaged in the investigation of scrub typhus fever in Burma, where the disease was assuming high importance as a military problem, Dr. Gilliam suffered a severe attack of this infection. As the first epidemiologist of the United States of America Typhus Commission, Dr. Gilliam contributed expert knowledge and original observations. To his scientific attainments were added qualities of enthusiasm, tact and comprehension which advanced the success of the commission's activities."

To Dr. Fred L. Soper, field staff member of the International Health Division of the Rockefeller Foundation:

"For meritorious service in connection with the work of the United States of America Typhus Commission. As one of the original members of the commission, Dr. Soper contributed to the organization of its first expedition to Egypt and to the direction of its first field studies in typhus control. In the latter part of 1943 and early in 1944, as head of the Rockefeller Foundation group in Italy, he cooperated with the United States of America Typhus Commission in stopping the outbreak of typhus fever at Naples. Dr. Soper placed at the service of the commission his many years of distinguished service in the administration and operative control of epidemic diseases."

VETERANS REHABILITATION CENTER

The Veterans Rehabilitation Center (2449 West Washington Boulevard, Chicago), operated jointly by the Department of Public Welfare, State of Illinois, and the Illinois Veterans' Service Inc., was formally dedicated November 3. The center has been receiving World War II veterans for treatment of selected psychiatric disorders since Sept. 11, 1944. The existing floor plan of the Washington Boulevard Hospital was utilized; operating rooms, wards, more desirable single rooms and adjoining hospital grounds were equipped and refurnished for use as arts and crafts rooms, recreational rooms, drama rooms, music rooms, gymnasium and gymnasium grounds.

All projects are under the supervision of full time specialists, who are assisted by qualified volunteers. The present treatment capacity of the center is 100 patients, which may easily be expanded to twice that number by slight increases in specialist personnel. Thirty beds are available for those veterans requiring psychiatric nursing supervision. It is anticipated that the majority of the veterans under treatment will live in their own homes or in suitable living quarters provided for them outside the center.

The psychiatric staff of the center consists of Dr. Alfred P. Solomon, clinical director, Dr. Thomas L. Fentress, associate clinical director, Dr. David Slight, professor of psychiatry at the University of Chicago, Dr. Clarence Neymann, professor of psychiatry at Northwestern University Medical School, and Dr. Morris Braude, associate professor of psychiatry at the University of Illinois College of Medicine. The clinical director

works in close cooperation with Dr. Conrad Sommer, deputy director of mental hygiene, Department of Public Welfare, State of Illinois. Dr. Sommer was responsible for the development of the initial plans for the center.

Each of the staff members has the responsibility of patients assigned to him for treatment either in individual or in group psychotherapy, and the supervision of one department of the activity program. The activity program has two major functions, diagnostic and therapeutic.

Shortly after the veteran has been introduced to the activity program, his work habits, his attitudes toward work and play, his vocational interests and antipathies, his skills and aptitudes and the character of his human relationships become apparent. These clinical observations, combined with the psychiatrist's study of the patient, the social service record and the results of psychologic testing, provide the basis for the adjustment of the activity program to the needs of the patient.

Activities are prescribed in the same manner as the orthopedic surgeon prescribes specific exercise for an extremity to encourage restoration of an impaired function. In the prescription of an activity designed to alter behavior, it is necessary that the psychiatrist orient the activity therapist as to the nature of the patient's emotions, his character traits and problems, so that the therapist will know the appropriate attitude to assume toward the patient. Furthermore, the psychiatrist must be aware of the possibilities for psychologic use of each activity so that, combined with the control of the human relationship factor, he is in position to direct development of qualities in the personality with the same degree of specificity with which he can direct development of the biceps muscle.

The function of the inpatient department of the Rehabilitation Center is planned for the treatment of psychoneurotic patients who do not require active medical and surgical care or psychiatric isolation and protection procedures. A primary consideration in all admittances is group morale. For this reason the right is reserved to reject for admittance or to discharge from the hospital any patient whose behavior might disrupt the morale of the group. Patients with physical disabilities that do not require medical or surgical treatment are eligible for admission and treatment of their psychoneuroses. Patients with organic diseases of the central or peripheral nervous system, excluding epilepsy and severe migraine, are eligible for admission if they have psychoneuroses and do not require neurologic care. Patients with psychoneurotic depressions will be accepted for treatment with the reservation that any patients who prove to be suicidal risks may be discharged or refused admission, as the Rehabilitation Center is not prepared to give them the necessary care and protection. The mildly schizophrenic who have made a social adjustment and who show no tendency toward overt hostile behavior will be accepted for treatment. No provision has been made to accept for admission patients with paranoid trends or delusions. Certain carefully selected patients with psychopathic personalities or alcoholism will be accepted for treatment if these patients are believed to have a sufficiently hopeful prognosis for a group adjustment. Patients are referred directly to the center, or arrangements are made for admission by a referring agency.

At the dedication of the Veterans Rehabilitation Center Dr. Alfred P. Solomon gave an address on "Activity Therapy at the Veterans' Rehabilitation Center"; Dr. Herman L. Kretschmer gave an address on "Mental Rehabilitation on a State Level." An address on "Men Back from Wars" was given by Col. William C. Porter, U. S. Army Medical Corps.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

McGuire General Hospital, Richmond, Va.: Shock, Capt. William A. Weiss; Burns, Dr. E. I. Evans, December 22.

Regional Hospital, Langley Field, Va.: Rheumoidal Arthritis, Dr. T. Dewey Davis; Cardiovascular Diseases, Dr. Douglas G. Chapman, December 29.

Newton D. Baker General Hospital, Martinsburg, W. Va.: End Results of Intervertebral Disk Operations, Dr. Walter E. Dandy; The Development of Plastic Surgery in World Wars I and II, Dr. John Staige Davis, December 18.

Deshon General Hospital, Butler, Pa.: Colostomy and Its Complications, Dr. Verne A. Dodd, December 19.

Air Base Hospital, Patterson Field, Dayton, Ohio: Diagnosis and Treatment of Pneumonia, with Emphasis on Primary Atypical Pneumonia, Dr. B. K. Wiseman, December 20.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL December 9, page 967)

CALIFORNIA

Permanente Foundation Hospital, Oakland. Capacity, 136; admissions, 3,693. Dr. Sidney R. Garfield, Superintendent (interns, July 1945).

NEW YORK

New York Post-Graduate Medical School and Hospital, New York. Capacity, 409; admissions, 8,622. Dr. William H. Meyer, Director of Radiology (1 resident—radiology, early in 1945).

Crouse-Irving Hospital, Syracuse. Capacity, 245; admissions, 7,035. Miss Dorothy Pellenz, Assistant Superintendent (interns).

OHIO

St. Thomas Hospital, Akron. Capacity, 235; admissions, 7,405. Sister M. Eleanor, R.N., Superintendent (2 interns, Jan. 1, 1945).

MEDICAL AID FOR DEPENDENTS OF SERVICE MEN

The North Atlantic area of the American Red Cross has adopted a plan providing for admission of "a limited number" of service men's dependents to voluntary hospitals without involved investigations of their financial status. The plan, developed by Brig. Gen. Ralph K. Robertson of the Second Service Command, provides that the city pay $3.25 a day for each patient, the private hospital making up the rest. No money is required from the Red Cross. Mr. E. Roland Harriman, manager of the North Atlantic area, stated that "the voluntary hospitals have been most generous for years in the admission of large numbers of service men's dependents referred to them by Red Cross chapters. A similar cordial cooperation has been given by the city hospitals and the Department of Welfare. The new plan, Mr. Harriman said, will create "a slight difference of emphasis which will make the service of voluntary hospitals more readily available." Proof only of dependency and medical indigence will be required for admission, eliminating the investigation usually made for "charity cases."

GERMANS FEAR SHORTAGE OF DOCTORS

The shortage of doctors in Germany has reached a new low. There are only 35,000 doctors, including those on duty with the armed forces, at the disposal of the 80,000,000 Germans living in Germany, according to the Swiss newspaper *Schaffhausenen Arbeiterzeitung*.

In an article reported recently to the Office of War Information the Swiss newspaper said that official Nazi quarters admitted the "rapid increase of tuberculosis" and the "frightening way the number of miscarriages is mounting" as well as the appearance of several other diseases such as "different chest and skin diseases."

"National Socialist circles follow this development with great anxiety, especially since the third reich lacks not only doctors but also medicines," the Swiss paper said, adding that this decline of the German people's health was the logical result of "bad and quantitatively insufficient nutrition."

EPIDEMIC OF RABIES IN VIENNA

An epidemic of rabies, believed to have started among German army dogs in the garrison on the outskirts of Vienna about a month ago, is raging in the city, and deaths are reported to be assuming alarming proportions, particularly among the civilian population. Austrian authorities are enlisting the aid of both press and radio to warn the population in an effort to circumscribe the outbreak. The Vienna radio announced recently that 43 dogs had been shot in the city.

ORGANIZATION SECTION

Postwar Medical Service

A meeting of the Committee on Postwar Medical Service was held October 28 at the headquarters office of the American Medical Association in Chicago. The meeting was called to order by the Chairman, Dr. Roger I. Lee. The following persons were present:

Dr. Roger I. Lee, Boston, Chairman.
Lieut. Col. Harold C. Lueth, Chicago.
Dr. Ernest E. Irons, Chicago.
Brig. Gen. Fred W. Rankin, Washington, D. C.
Dr. Evarts A. Graham, St. Louis.
Rev. A. M. Schwitalla, St. Louis.
Dr. Irvin Abell, Louisville, Ky.
Dr. Francis F. Borzell, Philadelphia, Central Committee, Wartime Graduate Medical Meetings.
Dr. J. F. Hassig, Kansas City, Kan., Federation of State Medical Boards.
Mr. Graham L. Davis, Battle Creek, Mich., American Hospital Association.
Dr. R. C. Williams, Washington, D. C., U. S. Public Health Service.
Col. Hugo Mella, Washington, D. C., Veterans' Administration.
Dr. Francis G. Blake, New Haven, Conn.
Dr. Frederick A. Coller, Ann Arbor, Mich.
Dr. James M. Mason, Birmingham, Ala.
Dr. Walter W. Palmer, New York.
Capt. William E. Eaton (MC), U. S. Navy.
Dr. Morris Fishbein, Chicago.
Dr. Arthur W. Allen, Boston.
Dr. Edwin P. Jordan, Chicago.
Lieut. Col. Gerard R. Gessner, Washington, D. C.
Col. George M. Powell, Washington, D. C.
Dr. Herman L. Kretschmer, Chicago.
Dr. James E. Paullin, Atlanta, Ga.
Dr. Victor Johnson, Chicago.
Dr. H. H. Shoulders, Nashville, Tenn.
Mr. E. R. Loveland, Philadelphia.
Mr. J. W. Holloway Jr., Chicago.
Dr. Olin West, Chicago.
Dr. R. L. Sensenich, South Bend, Ind.
C. Willard Camalier, D.D.S., Washington, D. C.
Miss Mary Switzer, Washington, D. C., Procurement and Assignment Service.
Dr. Frank H. Lahey, Boston, Directing Board, Procurement and Assignment Service.
Dr. Harold S. Diehl, Minneapolis, Directing Board, Procurement and Assignment Service.
Dr. Harvey B. Stone, Baltimore, Directing Board, Procurement and Assignment Service.
Miss Louise V. Baker, Washington, D. C., Procurement and Assignment Service.
Dr. Paul C. Barton, Washington, D. C., Procurement and Assignment Service.

In the absence of the Secretary, Dr. Alan Gregg, the Chairman appointed Dr. Ernest E. Irons Secretary pro tem.[1]

The minutes of the last meeting of the Committee were approved as circulated. The Chairman read the letter of resignation of Dr. Willard C. Rappleye, in which he stated that he resigned as representative of the Association of American Medical Colleges, being no longer an officer of the Association of American Medical Colleges or of the Advisory Board for Medical Specialties. This resignation was accepted. The Secretary pro tem was directed to request the Association of American Medical Colleges and the Advisory Board for Medical Specialties to name representatives to this Committee. (These requests have been forwarded to the secretaries of the aforementioned organizations.)

The Committee then proceeded to the consideration of the subcommittee reports.

A. Lieutenant Colonel Lueth reported on the progress of the tabulation of replies to the questionnaire sent out through the Surgeons General to the medical officers in the three services. Copies of these reports were submitted to the members. This subcommittee was continued.

B. The Subcommittee to Confer with the Surgeons General: Dr. Frederick A. Coller, Chairman; Dr. Walter W. Palmer, Rev. A. M. Schwitalla, Dr. Victor Johnson and Lieutenant Colonel Lueth. Dr. Coller reported for the subcommittee that he, Dr. Palmer and Father Schwitalla had conferred with the Surgeon General of the U. S. Army regarding in-service training and problems of demobilization. The subcommittee was asked to continue its work and at as early a date as possible to obtain a conference with the Surgeons General of the U. S. Navy and of the U. S. Public Health Service. The report of the subcommittee was received with thanks and the committee continued.

C. The relation of the Committee on Postwar Medical Service to the Procurement and Assignment Service was discussed at length. The directing board of the Procurement and Assignment Service has stated that it is its recommendation that Procurement and Assignment terminate with the termination of the war and that its records belong to the government. They would be quite willing to turn these records over but have no power, since the records are government property. Dr. Paullin stated that there was much information available in state and local groups which would be valuable in postwar medical demobilization and postwar medical educational plans. Dr. Stone suggested that the Committee on Postwar Medical Service might well look into the question of utilization of the knowledge and experience of state chairmen and their committees on Procurement and Assignment with a view to using their information for the assistance of returning medical officers.

The following subcommittee was appointed to draw up a report on the relation of the Committee on Postwar Medical Service and the Procurement and Assignment Service: Dr. Ernest E. Irons, Chairman; Dr. Morris Fishbein, Dr. Harold S. Diehl, Dr. Victor Johnson and Lieut. Col. Harold C. Lueth. This subcommittee is to submit a report at the next meeting of the Committee on Postwar Medical Service.

D. Capt. William E. Eaton for the Medical Corps of the Navy discussed the role of refresher courses in the training of medical officers. The possibilities and limitations of suggested resident training in army and navy hospitals were discussed.

E. Problems of the Veterans Administration with respect to medical personnel were discussed. Father Schwitalla suggested that the legal questions involved in the possible establishment of a medical corps in the Veterans' Administration be investigated. (The Chairman later appointed as a subcommittee, to investigate and report, Rev. A. M. Schwitalla, Chairman; Dr. H. H. Shoulders, Dr. Le Roy H. Sloan.)

F. Dr. Francis F. Borzell for the Central Committee of the Wartime Graduate Medical Meetings during the discussion emphasized the great contribution which the Wartime Graduate Medical Meetings have made to the medical aspects of the war effort. Dr. Borzell indicated the desire of the Central Committee to cooperate in any and all ways with the Committee on Postwar Medical Service. It was pointed out that the armed services would prefer to clear problems through one organization rather than through several. It was therefore agreed that the suggestion of Dr. Borzell and his committee be approved and that hereafter the Wartime Graduate Medical Meetings committee will clear through the Committee on Postwar Medical Service.

G. Lieut. Col. Harold C. Lueth reported on the activities of the Bureau of Information for medical veterans. The activities of this Bureau will include (1) informational service on educational questions, (2) state licensure and (3) relocation. Prospective desires and requirements of returning medical officers having now been approximately determined by the returned questionnaires, the problem now is to determine where the facilities can be obtained. A new questionnaire directed to hospitals and medical educational institutions has now been prepared through the Council on Medical Education and Hospitals under

1. The minutes of the meeting were taken by stenotype and are available for reference by members of the Committee. It was felt, however, that a brief summary of the Committee actions should be presented here in an abbreviated form. It should also be noted that certain items of importance do not appear in the stenotype records.

the direction of Dr. Victor Johnson and Lieutenant Colonel Lueth. This questionnaire is now being sent to hospitals, medical institutions and others, and it is hoped that a more complete knowledge of available facilities will shortly be obtained. Many medical officers have indicated their intention to return to their former residences. Others have indicated their intention to change their locations. The Bureau of Information of the American Medical Association plans to be of service to the latter group, furnishing information but not acting as a placement bureau. The cooperation of state and county units will be an important factor in the effectiveness of this bureau.

H. Dr. J. F. Hassig, representing Dr. Walter L. Bierring for the Federation of State Medical Boards, was asked to report on the recent recommendation for a uniform licensing law for temporary licenses. Dr. Hassig reported that the Federation thus far had no formal action to report.

I. Dr. Roger I. Lee reported on certain proposed voluntary lay funds to be used for postwar medical education of returning medical officers. At the moment such plans had not sufficiently materialized for formal report.

J. Dr. Victor Johnson reported for Dr. Walter W. Palmer for the Subcommittee on Postwar Residencies. The draft of the questionnaire sent to approved hospitals had been prepared to secure information on available residencies and on the possibility of extension of such residencies by hospitals.

K. Father Schwitalla reported for the information of the Committee that the Association of American Medical Colleges had laid on the table the proposal for bringing internship into the purview of the college curriculum.

L. It was reported that certain medical schools have been asked to submit lists for release from the medical departments of the armed services of desired and needed faculty teacher members.

The Committee adjourned to meet Saturday, Dec. 9, 1944, at 10 a. m., at 535 North Dearborn Street, Chicago.

ERNEST E. IRONS, M.D., Secretary Pro Tem.

Official Notes

THE PHILADELPHIA SESSION

Section Representatives to the Scientific Exhibit

Each section of the Scientific Assembly has appointed a representative to the Scientific Exhibit to assist and advise in securing exhibits for the Philadelphia session, June 18-22, 1945. The following physicians have received these appointments:

Practice of Medicine—Thomas C. Garrett, 3803 Oak Road, Germantown, Philadelphia.
Surgery, General and Abdominal—Owen H. Wangensteen, University of Minnesota Medical School, Minneapolis.
Obstetrics and Gynecology—Frederick H. Falls, 1853 West Polk Street, Chicago 12.
Ophthalmology—Georgiana D. Theobald, 120 Medical Arts Building, Oak Park, Ill.
Laryngology, Otology and Rhinology—Paul H. Holinger, 700 North Michigan Avenue, Chicago 11.
Pediatrics—W. Ambrose McGee, 1601 Monument Avenue, Richmond, Va.
Experimental Medicine and Therapeutics—Robert W. Wilkins, Evans Memorial Hospital, 65 East Newton Street, Boston.
Pathology and Physiology—F. W. Konzelmann, Atlantic City Hospital, Atlantic City, N. J.
Nervous and Mental Diseases—F. P. Moersch, Mayo Clinic, Rochester, Minn.
Dermatology and Syphilology—Hamilton Montgomery, 102 Second Avenue S.W., Rochester, Minn.
Preventive and Industrial Medicine and Public Health—Paul A. Davis, 1436 Delia Avenue, Akron, Ohio.
Urology—John H. Morrissey, 40 East Sixty-First Street, New York.
Orthopedic Surgery—David M. Bosworth, 742 Park Avenue, New York 21.
Gastroenterology and Proctology—Grant H. Laing, 104 South Michigan Avenue, Chicago.
Radiology—S. W. Donaldson, 326 North Ingalls Street, Ann Arbor, Mich.
Anesthesiology—Urban H. Eversole, 605 Commonwealth Avenue, Boston.

Application blanks for space in the Scientific Exhibit may be obtained from the section representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

Washington Letter

(From a Special Correspondent)

Dec. 11, 1944.

Army Needs 14,000 More Nurses

A pledge that men in the Army, Navy and Veterans hospitals will receive good nursing care was given by the National Nursing Council for War Services at its first Washington meeting, held in the Social Security Building here with some fifty representatives of governmental and voluntary nursing agencies present. Mrs. Elmira B. Wickenden, executive secretary, said that more than 50,000 out of a profession with 265,000 active members had already volunteered in spite of home front needs but that 14,000 more nurses are needed by the Army. They will be found, and "until military quotas are met civilian needs will be secondary," she said. Steps taken to recruit more nurses for military service include an appeal by Representative Francis P. Bolton (Republican, Ohio), sponsor of the act creating the U. S. Cadet Nurse Corps; emergency conferences in large cities, including Baltimore, Boston, Brooklyn, Newark, Philadelphia and San Francisco; review of nurses classified by the Procurement and Assignment Service Committee; employment of graduate nurses on a civilian basis by army hospitals, and cooperation of the Army, the Navy, the Office of War Information and the War Advertising Council on Publicity. Miss Stella Goöstray, principal of Children's Hospital School of Nursing, Boston, presided.

Extension of Recreational Facilities Urged

Provision of adequate recreational facilities for the war period and their extension after the war to meet increased peacetime necessities were urged at a conference of the War Recreation Workers Association held in the East Room of the White House. Mrs. Roosevelt expressed the opinion that our experience during the "bad economic situations" of the thirties should be a warning against permitting lack of coordinated recreational programs to affect the younger generation. Miss Ruth Green presided, and problems were discussed by Mrs. Roosevelt, Capt. Mildred McAfee, U.S.N.R., Mark McCloskey, director of Community War Services, Miss Helen Rowe, chairman, American Association for the Study of Group Work, Roy Sorenson, association general secretary, National Council, Y. M. C. A., and John I. Neasmith, Federal Security Agency.

President Roosevelt Endorses 1945 Poliomyelitis Drive

President Roosevelt has approved the request of Basil O'Connor, president of the National Foundation for Infantile Paralysis, to launch the foundation's 1945 fund raising drive on his next birthday, January 30. Mr. O'Connor announced that the 1945 march of dimes to the White House will be held from January 14 to January 31. In dedicating his birthday for the twelfth year to the fight against poliomyelitis the President said "The fight against infantile paralysis is a fight to the finish and the terms are unconditional surrender." He added "We face formidable enemies at home and abroad. Victory is achieved only at great cost, but victory is imperative on all fronts."

Capital Dentists Honor Horace Wells

On the 100th anniversary of his discovery of the principles of anesthesia, Horace Wells was honored by the District of Columbia Dental Society with the unveiling of a bust of Wells in the Medical Society Auditorium. During the ceremony several speeches were delivered on modern anesthesia, with leading medical men of the Capital, including military and governmental officials, taking part.

Eleven General Hospitals Needed at the Front

Col. Florence Blanchfield, superintendent of the Army Nurse Corps, has announced that eleven general hospitals must be established on the European front immediately and that nurses will be required to staff them. She said that men who are wounded or ill are returning from the battle fronts at the rate of 12,000 a week and require the care of 14,000 more nurses.

Safety Conditions in Federal Service Probed

A bill providing funds for the U. S. Employment Compensation Commission to investigate safety conditions in the civil service, which are described as far below those in private industry, has been reported out by the Senate Education and Labor Committee. The casualty report of the commission for the first half of 1944 shows a rise in frequency of occupational disabilities from 13 to 13.2 per cent per million man-hours worked. Average cost per federal employee is now $4.48 a year in benefit payments for accidents on the job.

Rats Menace Nation's Capital

Infestation of Washington by rats, which has made many District of Columbia dwellings unfit for habitation, is causing growing concern here. Major William H. Cary Jr., District director of sanitation, has called on District residents to help combat the city's estimated million rat population. The health department has only one experienced inspector and thirty assistants, in spite of about twenty thousand complaints being received annually.

Medical Legislation

DISTRICT OF COLUMBIA

Changes in Status.—H. R. 2644 has passed the House and Senate, granting additional powers to the Commissioners of the District of Columbia, including the authorization to waive the payment by any person in the military service of any annual or other periodic fee required by the law to be paid to the District of Columbia as a condition to retaining or renewing any license or permit to engage in any business or calling or to practice any profession. H. R. 3150 has passed the House and Senate, proposing to amend the healing arts practice act so as to eliminate the requirement that an applicant applying for a license without examination must have practiced the healing art under a license obtained in another jurisdiction for not less than two consecutive years immediately preceding the date of his application for his license in the District. As a substitute for this requirement the bill provides that the applicant must have practiced the healing art after the issuance of the license obtained in another jurisdiction for not less than one continuous year out of three years immediately preceding the date of his application for license in the District. This bill provides that the required one continuous year's practice may be either private, institutional or governmental, or a combination thereof. H. R. 3619 has passed the House and Senate, amending the act regulating the disposal of dead human bodies in the District. This bill provides for the appointment of deputies who will be authorized to issue permits for the removal of dead bodies from place to place within the District and for the recognition of foreign burial permits by superintendents and other persons in charge of cemeteries in the District. H. R. 4867 has passed the House and Senate, extending the health regulations of the District of Columbia relating to restaurants to similar establishments operated by the government.

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 2201 has been reported to the Senate, providing for promoting and maintaining the physical and mental fitness of employees of the federal government. This is a companion bill to H. R. 5257, which is pending in the House of Representatives with a favorable committee report. H. R. 4216 has been reported to the House, providing more efficient dental care for the personnel of the United States Navy. A special rule has been granted on this bill by the House Committee on Rules which assures early consideration. The bill is designed to accomplish its objective largely through a change in administrative practices and procedures which will place professional, technical and administrative dental matters in the hands of dental officers and will make the senior dental officer on ships and shore stations directly responsible to the commanding officer in this connection. H. R. 5587, the First Supplemental Appropriation Bill, 1945, has passed the House. Among other things, this bill makes available to the Veterans Administration the sum of $10,571,000 for hospital and domiciliary facilities. It also includes appropriations for the United States Public Health Service, including $963,400 for the pay of personnel and maintenance of hospitals and $1,875,000 for emergency health and sanitation activities. The latter appropriation will be used in connection with three projects, namely (1) plague control in the Hawaiian Islands of Maui and Hawaii, for protection of military personnel, (2) the conduct of antimalarial projects in centers of malaria transmission in a number of states for the purpose of meeting the impact of returning carriers among servicemen and (3) sanitary measures in Liberia primarily for the benefit of citizens of the United States, military and civil, stationed in or passing through that country. The House Committee on Appropriations refused to provide an appropriation of $205,000 for the Public Health Service for postwar planning and an appropriation of $773,000 for the control of tuberculosis. The committee thought that both of these projects should be given consideration in connection with a regular appropriation bill.

Bills Introduced.—S. J. Res. 163, introduced by Senator Davis, Pennsylvania, proposes that Congress shall give recognition to the fact that the success of the Selective Service System has been in a great measure due to the service of members of local draft boards and other persons who have served voluntarily and without compensation. S. 2148, introduced by Senator Kilgore, West Virginia, proposes to amend the Servicemen's Readjustment Act of 1944 to provide that the education and training to be had under that act shall be available to veterans without regard to their age and irrespective of whether or not their education or training was impeded, delayed, interrupted or interfered with by reason of entrance into the service. S. 2191, introduced by Senator Langer, North Dakota, and H. R. 5454, introduced by Representative Springer, Indiana, propose to amend the laws relating to veterans so as to eliminate the requirement that certain applicants for hospital treatment or domiciliary care shall take the pauper's oath. H. R. 5426, introduced by Representative Bolton, Ohio, H. R. 5431, introduced by Representative Norton, New Jersey, and H. R. 5432, introduced by Representative Smith, Maine, propose to incorporate the Medical Women Army-Navy Club. The objectives and purpose of the corporation will be, among other things, to endow a memorial to honor nurses of the Army and Navy who served as officers in World War II and to engage in activities for the promotion of the general welfare of the women commissioned officers of the Medical Departments of the Army and Navy. H. R. 5487, introduced by Representative Fish, New York, proposes to amend the National Cancer Institute Act so as to authorize an appropriation of $10,000,000 each fiscal year, beginning with the termination of hostilities with Germany, for the purpose of carrying out the provisions of that act.

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, Feb. 13-15. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 12-13. Dr. Victor Johnson, 535 N. Dearborn St., Chicago, Secretary.

American Academy of Orthopaedic Surgeons, Chicago, January 21-24. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Annual Forum on Allergy, Pittsburgh, January 20-21. Dr. Jonathan Forman, 956 Bryden Road, Columbus, Ohio, Director.

Puerto Rico, Medical Association of, Santurce, Dec. 15-17. Dr. E. Martinez-Rivera, P. O. Box 3866, Santurce, Secretary.

Society of Surgeons of New Jersey, Jersey City, January 31. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Special Lecture.—Dr. Arthur C. De Graff, Samuel A. Brown professor of therapeutics, New York University College of Medicine, will address a special meeting of the San Francisco County Medical Society and the San Francisco Heart Committee, December 18, on "Present Status of Digitalis and the Cardiac Glucosides in the Treatment of Congestive Heart Failure."

Free X-Ray Service.—An x-ray chest survey center was recently opened in San Francisco in the building of the city department of health and operated by the San Francisco Tuberculosis Association in cooperation with the local health department. The equipment was purchased with funds raised from the sale of Christmas seals. The center will provide free x-rays to the public five days each week and, when in full operation, will be capable of examining about 250 persons a day.

Plague and Tularemia.—*California's Health* reports that in September bubonic plague had been demonstrated in a pool of 164 fleas taken from 35 ground squirrels collected on a ranch in Kern County. During the same month, a pool from 4 ground squirrels collected on a ranch in Lassen County proved positive for plague. During the same month, six pools of fleas taken from squirrels on two ranches of San Luis Obispo County proved positive for plague. Tularemia was demonstrated in a pool of 16 ticks taken from ground squirrels on a military reservation in Monterey County. Tularemia was also demonstrated in eight pools of mice taken within 5 miles of San Luis Obispo City.

CONNECTICUT

State Society Opens Membership to Students.—On December 7 the house of delegates of the Connecticut State Medical Society adopted an amendment to its by-laws providing that any person whose legal or family residence is in the state of Connecticut who is a regularly enrolled student and a candidate for the degree of doctor of medicine in an acceptable medical school, as provided in section 478F of the Cumulative Statutes of Connecticut, or any person who is a student in an acceptable medical school located in the state of Connecticut may become a student member of the society. Also physicians not licensed to practice medicine in Connecticut who are serving as interns or residents in hospitals in Connecticut, for the purpose of extending their education and not primarily for remuneration, may become student members of the society. Such membership shall be obtained by applying to the council of the society on a form provided for that purpose and election by vote of a majority of the council. Student members will enjoy all the rights and privileges of membership in the society except that they shall not be eligible to vote or hold office. When such a student member is licensed to practice medicine in the state of Connecticut and settles in this state in practice or remunerative employment, he shall be eligible at once for election to active membership in the county association in the county in which he has settled without the waiting period of residence within the county, subject to such regulations as may be imposed by such county associations.

DISTRICT OF COLUMBIA

Action on "Borderline Certificates" Criticized.—The executive board of the Medical Society of the District of Columbia recently stated that the action of the Board of Medical Examiners of Maryland in discontinuing issuance of "borderline certificates" to physicians licensed in Washington "cannot be justified" and called on residents of nearby Maryland counties to make themselves heard in the matter. The certificates cost $1 and legalize the practice of medicine in Maryland by physicians licensed in the District of Columbia. Newspapers reported that some time prior to November 15 Dr. George C. Ruhland, District health officer, learned that no new borderline certificates would be issued. In a statement to the press the executive board of the District society said "it is unreasonable" to ask busy District physicians to spend a day making the trip to Baltimore to get a full license to practice in Maryland. The certificates are issued through the mail. Many county residents come in to the office of Washington physicians for treatment, and when they are ill at home "naturally expect to call physicians who have cared for them in their offices." If the present ruling of the board is enforced, it was stated, this will not be possible in a great many instances until these physicians have obtained the required (full) licenses." These cost $50 each. "The present arrangement under which reciprocal borderline certificates are issued has been in effect many years. To scrap it in the midst of a war and in the face of a shortage of physicians cannot be justified. Certainly the people should make themselves heard, for it is they who are most vitally affected," the board said.

IDAHO

Society News.—Dr. Archibald L. Hoyne, Chicago, discussed the "Management of Contagious Diseases in General Practice" at the October 18 meeting of the North Idaho District Medical Society in Lewiston. Dr. Hoyne, among others, also addressed the Southwest Idaho District Medical Society in Boise recently.

ILLINOIS

Free Antipneumonia Serum to Be Discontinued.—Effective January 1 the Illinois State Department of Public Health will discontinue the free distribution of antipneumococcic serum. This action is being taken with the approval of the pneumonia advisory council of the department and the council of the Illinois State Medical Society. At the time free distribution of antipneumococcic serum was begun by the Illinois State Department of Public Health in 1937, no other specific form of therapy was available, and the wide use of serum resulted in a pronounced decline in the case fatality rate of pneumonia. Since then, however, the discovery and introduction of new sulfonamide compounds such as sulfathiazole and sulfadiazine have provided a simpler and more economical therapeutic agent for this disease. Carefully controlled studies have shown that the treatment of pneumonia with sulfonamide drugs is equal, if not superior, to treatment with serum. The availability of penicillin for civilian use has provided an additional highly potent method of treatment where indicated. Sulfathiazole and sulfadiazine for the treatment of pneumonia may be had on request from the division of communicable diseases, all full time local health departments and all approved pneumonia typing laboratories.

Chicago

Personal.—Dr. Jacob V. Edlin has been given a leave of absence on account of ill health from his position as superintendent of the Chicago State Hospital. Dr. Frank J. Griffin is acting superintendent.

The McArthur Lecture.—Dr. Arnold R. Rich, associate professor of pathology, Johns Hopkins University School of Medicine, Baltimore, will deliver the twenty-first Lewis Linn McArthur Lecture of the Frank Billings Foundation at the Palmer House, February 23. His subject will be "Role of Hypersensitivity in the Pathogenesis of Rheumatic Fever and Periarteritis Nodosa."

Meeting on Industrial Medicine and Surgery.—The Central States Society of Industrial Medicine and Surgery held its midwinter scientific meeting at the Palmer House, December 8, under the presidency of Dr. Fred M. Miller. In addition to clinics at St. Luke's and Cook County hospitals, speakers on the program included Dr. Walter S. Priest on "Penicillin Therapy in Relation to the Problems of Industrial Medicine and Surgery." The program also included a panel discussion on "Fixations of Fractures" and one on "Head Injuries."

IOWA

Personal.—Dr. Gisle M. Lee, Thompson, was guest of honor at a banquet given by the Thompson Commercial Club, October 16, in recognition of the community's appreciation for his fifty years' service. He was presented with a silver gift in the form of one dollar for each year of service to the community.——Avery E. Lambert, Ph.D., professor of histology at State University of Iowa College of Medicine, Iowa City, who has been connected with the school since 1925, has reached the age of retirement but will continue some of his work on a part time basis.

First Tuberculosis Case Register.—The first central tuberculosis case register in Iowa was recently installed at Sunny Crest Sanatorium, Dubuque. The project, which was made possible through the efforts of the Dubuque County Tuberculosis Association, the staff of the sanatorium, the

Visiting Nurse Association and county and school nurses, will provide current information on the location of known patients in the county, the status of the disease and the treatment being received. It will guide health officials in administering the tuberculosis control program, which has been functioning for a number of years.

Blank Memorial Hospital Dedicated.—On December 3 the new $300,000 Raymond Blank Memorial Hospital for Children, Des Moines, was dedicated. The hospital, said to be the first in Iowa constructed exclusively for the treatment of children, is the gift of Mr. and Mrs. A. H. Blank, Des Moines, and is a memorial to their son, Raymond, who died March 7, 1943 at the age of 32. The hospital adjoins the Iowa Methodist Hospital. Among the speakers at the dedication were Dr. Walter L. Bierring, Des Moines, state health commissioner, and Dr. Morris Fishbein, Editor of THE JOURNAL. Mr. Blank made the presentation of the hospital, and the acceptances were given by Rolfe O. Wagner, president of the board of directors, Iowa Methodist Hospital, for the hospital and Gov. Bourke B. Hickenlooper for the people of Iowa.

KENTUCKY

New Director of Industrial Hygiene.—Dr. Wayne L. Ritter, U. S. Public Health Service, has been named director of the bureau of industrial hygiene of the Kentucky State Department of Health to succeed Dr. Walter E. Doyle, who was recently called to Washington, D. C. (THE JOURNAL, October 7, p. 379).

Personal.—Dr. William L. Cash, Princeton, examining physician for the Caldwell County Selective Service Board, was recently presented with an embossed certificate for patriotic service following three years of duty with the draft board. The certificate is signed by President Roosevelt, Major Gen. Lewis B. Hershey, director of Selective Service, Gov. Simeon S. Willis and Col. Frank D. Rash, state director of selective service.——Dr. Isham Kimbell has resigned as head of the Central State Hospital, Lakeland, to become a member of the staff of the Veterans Administration Facility, Fort Lyon, Colo., effective October 31.

MAINE

Society News.—Dr. Ralf S. Martin, Portland, addressed the York County Medical Society in Kittery, October 11, on "Recent Advances in Rheumatic Fever." Other speakers included Dr. Adam P. Leighton, Portland, president-elect of the Maine Medical Association, who discussed the opening of a medical school in the state.——Dr. Edwin H. Place, Boston, discussed "Contagious Diseases and Complications" before the Penobscot County Medical Association in Bangor, October 17.

MASSACHUSETTS

Session on Obstetrics.—The sixteenth annual meeting of the New England Obstetrical and Gynecological Society was held at the Harvard Club, Boston, December 6, under the presidency of Dr. Roy J. Heffernan, Brookline, whose address was titled "Role of the Transverse Cervical Cesarean, and the Management of Placenta Previa." Among the speakers were:

Dr. Louis E. Phaneuf, Boston, The Repair of the Lacerated Perineum.
Dr. Maurice O. Belson, Boston, Management of the Third Stage of Labor.
Dr. Meyer D. Schnall, Boston, Sternal Transfusions in Obstetrics and Gynecology.
Dr. Joe V. Meigs, Boston, Ureter in Pelvic Surgery.
Dr. Harold H. Rosenfield, Boston, Report on Obstetric Analgesia.
Dr. George W. Waterman, Providence, R. I., Committee's Report Concerning the Emergency Maternal and Infant Care.
Dr. C. Wesley Sewall, Boston, Experience with the Rh Factor from the Obstetric Viewpoint.
Dr. John M. Fallon, Worcester, Photographic Clinic.

Bureau of Clinical Information Formed.—The Massachusetts Medical Society has established a bureau of clinical information as a means of augmenting its postgraduate educational effort. The bureau will supply information on the daily activities of approved hospitals in Boston and its immediate vicinity covering each hospital's schedule of operations for the day, medical and surgical ward rounds, clinics, the location of such clinics and the names of those presiding over these various activities. From time to time the bureau will make available a bulletin which will list the fixed medical meetings and conferences held in the metropolitan area. This bulletin will be sent to hospitals, medical schools and physicians on request and will be available at the bureau. The bureau will be open from 7 to 10 a. m. and from 3 to 8 p. m. except Saturday afternoons. Information will be given by telephone. No expense is involved on the part of those using this service.

MINNESOTA

Illegal Practitioner Sentenced.—On October 27 Frank J. Brady, alias Frank Bateman, pleaded guilty in the district court of Hennepin County to a charge of practicing healing without a basic science certificate and was sentenced to a term of one year in the Minneapolis workhouse. Evidence was introduced to show that Brady had been performing illegal abortions although he claimed to be a bartender by occupation.

Medical Conference.—The North Central Medical Conference met at the Hotel St. Paul, St. Paul, December 10, under the presidency of Dr. Leonard W. Larson, Bismarck, N. D., who discussed responsibility of medicine in planning for postwar medical services. Dr. L. Fernald Foster, Bay City, Mich., secretary, Michigan State Medical Society, talked on prepaid medical service. Other speakers on the program included:

Dr. Raymond G. Arveson, Frederic, Wis., A Wisconsin Committee Takes a Trip.
Dr. Alfred W. Adson, Rochester, Council on Medical Service and Public Relations of the American Medical Association.
Dr. Joseph W. Lawrence, Washington, D. C., My First Six Months in Washington.
Mr. Charles H. Crownhart, Madison, Wis., Shall State Associations Develop Committees on Medical Service and Public Relations?

NEW JERSEY

State Society Acquires New Home.—The Medical Society of New Jersey has purchased a fifteen room house at a cost of $30,000 at 315 West State Street, Trenton, to serve as its headquarters. Facilities are provided for the executive and editorial offices as well as six meeting rooms for groups of 25 and one large assembly hall for a group of 150. The house is built of concrete with a green tile roof. The grounds are completely landscaped, offering ample accommodations for parking cars as well as a seven car garage. The entire property is 90 by 420 feet. The interior is now being redecorated, and the society hopes to occupy it by Christmas.

New home of state society.

NEW YORK

Fellowship in Public Health.—The Mary Pemberton Nourse Fellowship in public health is open for award by Vassar College, Poughkeepsie, April 1. The fellowship, amounting to $2,500, is offered to a woman college or university graduate for original and outstanding work in public health at any approved institution. The money is intended to enable her to spend a year in study, in the carrying forward of an original project or in writing on the subject. Candidates should submit their application not later than March 1. The award will be made by the Vassar College Committee on Graduate Study on the nomination of an advisory committee of three selected by the college, one representing public health interests, a physician and an expert in public health. Application blanks should be secured from and returned to the president's office, Vassar College, Poughkeepsie.

New York City

Treatment of Mental Disorders in Children.—A feature of the proposed four million dollar postwar expansion program at Creedmoor State Hospital is an expenditure of $300,000 to create a children's division for the exclusive treatment of mental disorders in young persons.

Remington Medal Presented.—The Remington Honor Medal was presented to Dr. Harvey Evert Kendig, dean of the Temple University School of Pharmacy, Philadelphia, at a dinner of the New York Branch of the American Pharmaceutical Association at the annual meeting December 12 (THE JOURNAL, June 24, p. 589).

Personal.—Mr. Bernard S. Coleman, S.B., who for ten years has been secretary of the tuberculosis committee of the New York Tuberculosis and Health Association, has been appointed director of the council of National Jewish Tuberculosis Institutions, with headquarters in Denver, effective January 2.—— Drs. Thomas A. McGoldrick, formerly president of the Medical Society of the State of New York, and Thomas M. Brennan, both of Brooklyn, have recently been made Knights of St. Gregory the Great by Pope Pius XII for services to their faith and their charitable works in the diocese.——Dr. Emanuel W. Lipschutz, Brooklyn, has recently been appointed adjunct professor of gastroenterology at the New York Polyclinic Medical School and Hospital.

Trauma and Cardiac Disabilities.—The role of trauma in the causation of cardiac disabilities is the theme of a new program sponsored by the New York Cardiological Society which will be carried out as a continuing series of investigations and reports on clinical statistics, experimental investigation, pathology and medicolegal aspects. The object of the new project is to study all angles of the relationship between trauma and heart disease and to formulate, on the basis of the widest investigation possible, a reasonable code for the guidance of expert opinion. The project grew out of a suggestion by Dr. Raphael Lewy, chief medical consultant of the workmen's compensation bureau, New York State Department of Labor, now retiring after more than thirty years of service, who said that expert opinions have shown such wide variance that it is of paramount importance for some dispassionate and competent body to examine all evidence in the literature and conduct such investigations as will produce a set of reasonable criteria that will have authority and general acceptance. Various grants and funds from the society's treasury will be used to finance the work. On January 24 an introductory meeting will be held at the New York Academy of Medicine to which interested organizations, practicing physicians and officials are invited. Information may be obtained from the secretary of the New York Cardiological Society, Dr. Philip Reichert, 480 Park Avenue, New York 22.

OHIO

Special Society Election.—Dr. Clarence E. Hufford, Cleveland, is the new president of the Ohio State Radiology Society. Dr. Harold G. Reineke, Cincinnati, is vice president and Dr. Henry Snow, Dayton, secretary-treasurer.

State Society Organizes Insurance Company.—The Ohio State Medical Association announced on November 16 that it was organizing a "stock medical expense insurance company" to be owned by its members, which would offer policies covering doctor's bills and supplementing established group hospitalization programs. Newspaper reports indicated that the association would not operate the company but was merely the organizing agency. When the company is incorporated and ready for operation it will be administered under the guidance of members of the medical profession who have become stockholders and incorporators.

Charles Doan Appointed Dean of State University.—Dr. Charles A. Doan, since 1936 chairman of the department of medicine at the Ohio State University College of Medicine, Columbus, has been appointed dean of the medical school, effective at once. Dr. Hardy A. Kemp, who took a leave of absence in 1942 to enter military service, has been appointed professor of public health and hygiene, to become effective on his return to the campus. Dr. Leslie L. Bigelow served as acting dean of the medical school until his death, Jan. 15, 1943. Since then Rollo C. Baker, Ph.D., has been acting dean; he will continue as professor of anatomy. Dr. Doan graduated at Johns Hopkins University School of Medicine, Baltimore, in 1923. He joined the staff at Ohio state in 1930 as professor of medicine and director of the department of medical and surgical research. In 1936 his title was changed to chairman of the department of medicine.

TEXAS

Proposed Merger of City and County Health Departments.—The Dallas County Medical Society has approved a recommendation to consolidate the city and county health departments which, if adopted by the city council and county commissioners' court and subsequent legislation, would provide that the merged unit would be housed in enlarged headquarters at Parkland Hospital, jointly operated by the city and county.

Physicians Cooperate in Hospital Unit.—Physicians in Dallas are cooperating in defraying the expenses of one complete unit of the Truett Memorial Building at Baylor University Hospital. The unit will be identified by a plaque bearing the name of the Dallas County Medical Society as the donor, and $50,000 will be raised from members of the society to underwrite the cost of the unit. According to the *Texas State Journal of Medicine* this action was part of a campaign to raise $1,200,000 for the memorial building and new quarters for the Baylor University School of Nursing and College of Dentistry.

WISCONSIN

Memorial to Physician.—On December 17 an electric organ will be dedicated at Wisconsin Memorial Park Cemetery in memory of the late Dr. Christopher G. Johnson, Chicago and Milwaukee. The organ is the gift of Mrs. Johnson and the ceremonies will take place in the park's Memorial Church, Milwaukee.

GENERAL

Prize for Work on Glaucoma.—A prize of $500 for the most valuable original paper adding to existing knowledge about the diagnosis of early glaucoma or the medical treatment of noncongestive glaucoma is being offered by the National Society for the Prevention of Blindness, 1790 Broadway, New York 19. This award will take the place of two separate prizes of $250 each which had been announced in THE JOURNAL, Dec. 12, 1942, page 1238, and Aug. 21, 1943, page 1197. Papers may be presented by any practicing ophthalmologist of the Western Hemisphere and may be written in English, French, German, Italian, Spanish or Portuguese. Those written in any of the last four languages should be accompanied by a summary in English.

Child Care Pamphlets.—The bureau of child hygiene of the New York City Department of Health issues a series of pamphlets on child care, one group designed for the professional staff concerned with the care of children, the other for parents. Many of the pamphlets concern eating habits. For these the demand has been exceedingly great, so that more than 300,000 of these have been issued. The pamphlets, which are purchasable at cost directly from the New York City Committee on Mental Hygiene, 105 East Twenty-Second Street, New York City, include:

Eating Problems of Children.
If Your Child Does Not Eat Well.
Children Like to Eat.
Children's Eating Habits.
What Should We Expect of Our Children?

Health Security in Postwar America.—The second wartime conference on labor health security was held at the Hotel McAlpin, New York, December 8. The theme of the general session was "Health Security in Postwar America" with the following speakers:

Mr. Eugene P. Connolly, secretary, New York County, American Labor Party.
Miss Bertha C. Reynolds, director, Personal Service Department, National Maritime Union of America, C. I. O.
Representative Adam Clayton Powell Jr.
Miss Helen Hutton, field secretary, Fort Greene Industrial Health Committee.
Mr. Winslow Carlton, temporary secretary, Health Insurance Plan of Greater New York.
Mr. George F. Addes, Detroit, international secretary-treasurer, United Automobile Workers of America, C. I. O.
Alfred J. Asgis, Ph.D., chairman, Health Council, American Labor Party.

A series of panel discussions on postwar health and relocation of health personnel made up the second session.

Contact Lens Society Formed.—The Society for the Advancement of Contact Lens Research was organized at a meeting in New York, November 18. Active members will consist of ophthalmologists, optometrists, dispensing opticians, contact lens technicians and manufacturers of contact lenses, while associate membership will be available to persons who are interested in the advancement of contact lenses and in their development. The board of directors is to consist of fifteen members, three to be ophthalmologists, three optometrists, three opticians, three contact lens technicians and three contact lens manufacturers. The society will aim to improve and promote research in and development of contact lenses, to establish a foundation for research in any or all phases of the contact lens field and to instil mutual understanding and cooperation among all persons interested in contact lenses by disseminating authoritative information. Members of the organizing committee were Philip L. Salvatori, New York; Ewing Adams, O.D., Detroit; Albert L. Anderson, Minneapolis; Phil E. Dempsey, Toledo, Ohio; Dr. Abraham Allan Rossby, New York, and Gertrud Salvatori, New York.

LATIN AMERICA

Health Activities in Latin America.—*New Journal.*—*Arquivos Brisileiros de Nutrição,* a monthly journal, recently made its appearance. It is the organ of the National Department of Nutrition in Brazil, which works in collaboration with the Nutrition Foundation of New York. Dr. Josue de Castro, Rua Araujo Porto Alegre, Rio de Janeiro, Brazil, is the editor. The first three issues contain a section of original articles, editorials, literature on nutrition and news.

Society News.—The Medical Association of the Isthmian Canal Zone was addressed on October 17 at the Margarita Hospital, among others, by Drs. Merrill H. Judd, Cristobal, C. Z., and James P. Wallace, Cleveland, on "Treatment of Burns"; Oscar Tannenbaum, New York, "Diagnosis of Cardiovascular Syphilis," and Oakley K. Park, St. Louis, "Penicillin or Chemotherapy."——Dr. Gregoria Aráoz Alfaro, Buenos Aires, was recently appointed president of the Instituto Internacional Americano de Proteccion a la Infancia, and Dr. Victor Escardó y Anaya, Montevideo, Uruguay, secretary and director of the department of health.

Bust of William Harvey Unveiled.—On October 30, at a special meeting of the faculty of medicine of the National Autonomous University of Mexico, a bronze bust of William Harvey, the discoverer of the circulation of the blood, was unveiled. It is the work of Dr. J. G. Martin del Campo. Dr. Alfonso Caso, dean of the university, presided and speakers included Mr. Charles H. Bateman, the ambassador of England in Mexico, and Dr. J. J. Izquierdo.

Personal.—Two Panamanian physicians are among the Latin America students who arrived in London early in October to study under the sponsorship of the British Council. Dr. J. Bianchi will undertake a general study of gastroenterology, while Dr. J. Gonzalez will be attached to the oral surgery section of East Grinstead Hospital.——Drs. Gabriel Gomez Del Rio, professor of pediatrics at the University of Havana and director of Children's Hospital, and Dr. Aurelio Ituarte G. De La Solana, minister of public health and chief of the medical division of the Finlay Institute, spent several weeks' study on poliomyelitis at the University of Chicago recently. The two physicians have been named chief consultants in Cuba's new poliomyelitis hospital, which was to be opened in Cuba some time in November, it is reported.——Dr. Rafael Angel Calderón Guardia, formerly president of Costa Rica, recently visited Mexico City on his way to New York City, where he will study with Dr. George T. Pack. In a report to the press Dr. Calderón Guardia is reported to have said that his decision to pursue cancer research was inspired by the death of his father, also a physician, from cancer.——Dr. Marjorie L. Warner, a 1944 graduate of Ohio State University College of Medicine, Columbus, is said to be the first American woman to serve as an intern at Santa Tomas Hospital, Panama City. ——Dr. Wayne Gilder was recently presented with $250 worth of war bonds in recognition of his more than twenty years service at Colon Hospital, Cristobal, C. Z., where he is now serving as district physician.

First Tuberculosis Sanatorium in Haiti.—A 100 bed hospital, financed by public subscription, was recently completed at Port au Prince, the result of efforts of the National Antituberculosis League of Haiti, founded in July 1942, to help the government combat tuberculosis. The sanatorium is said to be the first of its kind in Haiti. In describing the new project the *Bulletin* of the National Tuberculosis Association states that, since death registration in Haiti is inadequate, the only reliable indication of the relative importance of various diseases lies in the records of government hospitals where tuberculosis is the principal cause of death and further that the disease has shown a well defined tendency to increase from 1918 to 1941. Haiti has a population of three and one-half million on a land surface of 28,000 square kilometers, half of which consists of lofty mountains. While no accurate figure can be given on the morbidity of the disease, the first figures compiled since April 1941 show the following information for positive skin reactions to tuberculin tests:

from 0 to 1 year, 37.7 per cent
from 1 to 2 years, 25 per cent
from 8 to 12 years, 60 per cent
from 12 to 18 years, 85 per cent
among students, 80 to 85 per cent
among adults of all classes 85 to 90 per cent

Leprosy Conference.—The International Leprosy Association and the Pan American Sanitary Bureau are planning a second Pan American Leprosy Conference for Rio de Janeiro sometime in 1945. Drs. Pedro L. Balina, Buenos Aires, is the chairman and H. C. de Souza-Araujo the vice chairman of the western section of the International Leprosy Association. A feature of the conference will be the presentation of three prizes for articles on leprosy, created by the National Academy of Medicine of Rio de Janeiro. First prize, of about $500, will be given for the best work on etiology and pathogenesis of leprosy. Second and third prizes, of about $250, with be given for articles on practical results of treatment of leprosy and history and epidemiology of leprosy in Brazil.

FOREIGN

Proposed Chair of Dermatology.—A gift of £70,000 has been made to the University of Edinburgh by Sir Robert McVitie Grant to establish a chair of dermatology which, it is reported in *Science,* will be the first of its kind to be created in Great Britain.

All Negro Mission for Health Program.—At the request of the Liberian government an all Negro mission of eleven American physicians, engineers, entomologists and nurses has been created by the U. S. Public Health Service in cooperation with the state and war departments at the direction of President Roosevelt to develop a five year health and sanitation program in Liberia. Members of the group include Dr. John Baldwin West, head of the mission and senior surgeon in the U. S. Public Health Service, Granville W. Woodson, sanitary engineer, and John P. Davies Jr., maintenance superintendent. The mission will be expected to do whatever it can to bring communicable diseases in Liberia under control, to protect as far as possible the military personnel and transients from the United States and other Allied nations in Liberia against such diseases and to reduce the chances of their transmission to the United States. The various aspects of the mission's work will be financed by public and private agencies, the major portion to be borne by the public health service. The division of cultural cooperation of the Department of State is contributing funds to be used for the improvement of nursing education, a program that will be under the jurisdiction of the mission. Fellowships for the medical training of Liberians in this country will be provided by the Rockefeller Foundation. The mission's work will be similar to the extracantonment activity now carried on by the public health service in cooperation with state and local health departments in the vicinity of military establishments in the United States and to the work of the public health service venereal disease control mission, which was sent to Trinidad with the permission of the British government, and to the work of American missions in controlling malaria along the Burma Road and in aiding the Chinese government in controlling that disease and improving sanitary conditions along the railroad paralleling the Burma Road. The Liberian health mission will apply malaria control procedures in Monrovia, Kakata, Roberts Field and Fish Lake and the country surrounding those localities. In addition to draining and filling, it will carry on larviciding and house spraying. In the water borne disease field the mission will check existing wells and other sources of water supply, condemn polluted sources and drill temporary wells where need for them is established. A survey will be made to determine the need for a temporary filtration plant at Monrovia to protect transients and provide ships with water. The sewage disposal methods now in use will be studied with a view to their improvement, and a program of food inspection will be inaugurated to form the basis of recommendations to the government of Liberia for national legislation covering the sale of foodstuffs. The mission's work will involve, in addition to the draining and filling of swampy areas, the utilization of other methods of controlling aquatic forms of disease transmitting agents. It will also have control of water supply and sewage disposal. The mission will be expected to assist the Liberian government in the development of a broader public health service, including the training of a director, the establishment of divisions of communicable disease control, malaria control, venereal disease control, vital statistics and other divisions essential to the needs of the republic.

CORRECTION

American Public Health Association Health Insurance Declaration.—In the editorial with this title on page 434 of THE JOURNAL, October 14, it was stated that "of the 7,493 members of the American Public Health Association 1,571 are Fellows." THE JOURNAL is now informed by the American Public Health Association that these figures were intended to be mutually exclusive, that is, 7,493 members plus 1,571 Fellows, a total of 9,064.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 11, 1944.

International Unit of Penicillin

A conference convened in London by the Health Section of the League of Nations has agreed on the standardization of penicillin. Sir Henry Dale, president of the Royal Society, presided at the conference. The delegates were as follows: Australia, Major J. L. Bazeley (Commonwealth Serum Laboratories); Canada, Dr. G. D. W. Cameron (chief, Laboratory of Hygiene, Department of Pensions and National Health, Ottawa); France, Dr. J. Trefouel (director of the Pasteur Institute); United Kingdom, Dr. C. R. Harington (National Institute of Medical Research) and Dr. J. W. Trevan (Wellcome Physiological Research Laboratories); United States, Dr. R. D. Coghill (Northern Region Research Laboratory, Peoria, Ill.), Dr. R. P. Herwick (chief of the Drug Division of the Food and Drug Administration) and Dr. M. V. Veldee (chief, Division of Biologics Control, U. S. Public Health Service). Sir Alexander Fleming, the discoverer of penicillin, and N. G. Heatley attended as advisers. The international unit agreed on was "the specific penicillin activity contained in 0.6 microgram of the international standard," but particulars of the standard have not yet been announced.

Casualties of the Bombardment of England from the French Coast

The strip of England nearest France contains the pleasant seaside resorts of Dover, Folkestone, Deal, Ramsgate and the neighboring villages. They are in no sense military targets, but for four years they have been bombarded by the Germans from the French coast as part of "total war." This locality has therefore earned the name of "Hellfire Corner." When the mayor of Dover recently announced the receipt of official information that all long range guns on the other side of the English Channel had been captured, the people were quick to celebrate the occasion by gathering in the streets, shouting, dancing and singing. The casualties of the four year bombardment can now be given. The total number of shells recorded, which is not quite complete, is 2,565. These killed 157 persons and injured 671, though the inhabitants lived largely in shelters. In addition, 163 persons were killed and 611 injured by bombs. The worst bombardment of Dover was on Sept. 26, 1940, when in five hours 63 shells fell, nearly 50 in one area. A hostel was hit and 49 persons were killed.

British Share Their Rations with the Greeks

The Germans deliberately produced a famine in Greece. In addition to their usual barbarities they seized the whole supply of olive oil, of which Greece is the principal producer in Europe, and also the fruits of the Greek islands. The result was that a large proportion of the population perished from starvation. Immediately on entering Greece the British brought food supplies, but transport is a great difficulty. Greece now obtains 130,000 tons of supplies a month, made up of 50,000 tons of wheat, 10,000 tons of other food and 70,000 tons of clothes and medicines.

Research on Human and Animal Trypanosomiasis

The secretary of state for the colonies has appointed a tsetse fly and trypanosomiasis committee to consider and advise on the coordination of action, including research, directed against human and animal trypanosomiasis and in particular against the tsetse fly as the chief vector. The committee, on which the Dominions Office and the Sudan government are represented, will report from time to time to the secretary of state. On all matters affecting research its recommendations will be referred to the Colonial Research Committee for comment and advice before submission. The committee includes Prof. P. A. Buxton, London School of Tropical Medicine; Dr. H. Lyndhurst Duke, lately director of the Human Trypanosomiasis Institute in Uganda and chairman of the League of Nations Sleeping Sickness Committee; Prof. I. M. Heilbron, Imperial College of Science; Dr. E. M. Lourie, Liverpool School of Tropical Medicine; Dr. S. A. Neave, director of the Imperial Institute of Entomology; Dr. A. H. G. Smart, medical adviser to the secretary of state for the colonies; Mr. John Smith, adviser on animal health to the secretary of state for the colonies, and Dr. H. A. Tempany, agricultural adviser to the secretary of state for the colonies.

Skin Cover for War Wounds and Burns

The War Office has issued to all medical officers a memorandum on skin cover for wounds and burns. This begins by pointing out that there is little scope for primary closure of wounds caused by missiles, because (1) infection is deeply introduced, (2) the time lag between injury and primary operation is usually greater than in industrial injuries and (3) it is seldom possible for the wounded man to remain at the surgical center which first deals with his wound. Hence most medical directorates completely ban the procedure. But this creates an urgent secondary problem: finding the best methods, when the danger period is over, to obtain early closure. It is recommended that consulting surgeons should bring to the notice of all surgeons in their command the value of delayed primary suture, secondary suture and simple skin grafting. Delayed or secondary suture should be considered (1) when the bacteriologic state of the wound is under control (sterility cannot be expected), (2) when the loss of tissue, particularly skin, is small and (3) when the deeper tissues, especially muscle, can be brought together without undue tension. A common cause of failure is suture of the skin under excessive tension.

Skin cover by free grafting should be the method of choice when the loss of tissue makes secondary suture impossible. All open granulating wounds should be closed or grafted before that deep unabsorbable fibrous base develops which will neither heal nor accept a graft but which will later require a complicated plastic operation. Spaced postage stamp razor grafts laid on tulle gras sheets are especially useful when sepsis is anticipated. This procedure is recommended for all surgeons. But experienced general surgeons should employ a "direct flap" in cases of avulsion of the skin in such regions as the hand, wrist or forearm laying bare or damaging tendons, nerves or joints. The damaged area should be covered by an immediate abdominal flap. The "grenade hand" is an example. Injuries of the lower leg, ankle and foot, if bone and tendons are exposed, should be transferred to a plastic surgery center. This also holds for the knee and popliteal regions if the defect is large.

Preparation for Medical Demobilization

At the request of the minister of health a subcommittee of the Central Medical War Committee known as the Demobilization Committee was appointed to advise on the release of medical officers after the war. The government had announced that the main considerations in determining priority of release would be age and length of service. The task of the committee was to determine how best under this general plan to combine justice to the serving doctors and satisfaction of the more urgent needs of civilian practice. The result of its recommendations is the following plan, adopted by the government: General demobilization must await the total defeat of the Axis. All that is now contemplated is reallocation of manpower between the armed forces and civilian work when Germany has been defeated while Japan remains at war. As there can be no break in the war effort, military requirements will override all other considerations. Compulsory recruitment for the armed forces will

be continued. But it will be possible to bring relief to the men who have served for long periods and through continued recruitment to enable them to return home. There will be two methods of selection: A larger group will be selected for release according to age and length of service; a smaller group will consist of men required for urgent reconstruction work at home. These will include a limited number of men with special qualifications, for whose transfer application must be made through government departments. No man will be released if his retention is considered necessary on military grounds. In the former class there will be a special priority group for men over 50, who will be released before others if they wish. Otherwise the criterion will be a combination of age and length of war service on the basis that two months of service equals one additional year of age.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, Nov. 20, 1944.

A Meeting of Obstetricians and Gynecologists

Jointly organized by the Brazilian Society of Obstetrics and Gynecology and by the São Paulo State Medical Association a large meeting of practitioners of these medical specialties from the cities of Rio de Janeiro and São Paulo, the two most important medical centers of the country, has just been held in this city. Among the leading figures present at the meeting were Drs. Arnaldo de Moraes, J. Rodrigues Lima, Ary Novis, Goulart de Andrade, Paulo Barata, Motta Maia and Mario Pardal from Rio de Janeiro, and Drs. Ayres Netto, Altino Antunes, Escobar Pires, Cyro Camargo, Arruda Sampaio, José Gallucci, Wolff Netto and A. Guidi from São Paulo. The more important subjects discussed at the meeting were the treatment of uterine prolapse, arrhenoblastoma, hypernephroid tumor of the ovary, anemias of pregnancy, grading the malignancy in cancer of the uterine cervix, early diagnosis of cancer of the uterine cervix, neonatal mortality, x-ray visualization of the placenta, uterine cancer and pregnancy, surgical treatment of uterine myoma, indication of the different kinds of anesthesia in gynecology and gigantic tumors of the ovary.

At the close of the meeting Dr. A. Oliveira Lima, commissioner of health for the Federal District (Rio de Janeiro), addressed the obstetricians and gynecologists to point out the present situation in the administration of maternity care in the largest city of Brazil. He began by emphasizing that in this city an average of almost 50 per cent of the maternal deaths are due to puerperal infection, more than 20 per cent to toxemia and more than 10 per cent to hemorrhage. These figures define the large task that the health organization of the city has to face, particularly because the number of hospital beds for maternity is clearly insufficient. Out of a total of 41,768 births registered during the year 1943, only 14,606 deliveries were attended by physicians in hospitals. There are 207 beds for maternity cases in the eight municipal hospitals (an average of 25.9 beds per hospital), while 6,480 pregnant women were attended during the year 1943, an average of 31.3 deliveries per bed during the year, which corresponds to an average of 11.7 days per bed per case. The only hospital entirely devoted to maternity cases in Rio de Janeiro is the Pro-Matre Hospital, which is a private institution. But the city administration has completed plans to erect a lying-in hospital with 400 beds, the building of which is about to begin.

Sixth Pan American Congress of Tuberculosis

The sixth Pan American Congress of Tuberculosis will be held at Havana, Cuba, in January 1945 to discuss three main subjects: BCG vaccine in the control of tuberculosis, clinical forms of incipient tuberculosis and the systematic plan of treatment of cavernous tuberculosis. The Brazilian committee for the organization of the congress has chosen Drs. Arlindo de Assis, Manoel de Abreu and A. MacDowell to present special reports on these subjects. Drs. José Rosemberg, Jayme S. Neves, Reginaldo Fernandes, Alberto Renzo, A. Ibiapina, Aresky Amorim and Hugo Pinheiro Guimarães will also present papers on the same topics.

Malaria in the State of São Paulo

The Service of Malaria Control of the São Paulo State Health Department recently published an important volume with tables, diagrams and halftones to show its work in the last few years. The organization of the service includes several divisions: the Division of Treatment and Education, which has about fifteen fixed stations located in the malarial districts and a few movable stations; the Division of Statistics and Epidemiology; the Division of Control, which is in charge of all the work of spraying houses, oiling and dusting ponds and marshes, draining seepage water and collecting blood samples; and the Division of Laboratory, with such tasks as examining blood samples and classifying mosquitoes. An important part of the service is the Malaria Experiment Station at Guarujá, where many valuable studies have been made. The tables and graphs show that the death rate from malaria in all the state of São Paulo varied from 10.53 per hundred thousand of population in 1930 to 39.00 per hundred thousand in 1938, the minimum rate having been 8.25 in 1938. The number of cases reported varied from 3,291 in 1933 to 181,398 in 1941, when there was a serious outbreak. The lowlands of the Atlantic border, which represent only 5 per cent of the area of the state, had 40.64 per cent of the cases during the 1941 malarial season.

Brief Items

Dr. Jorge de Morais Grey, a practicing surgeon at Rio de Janeiro, has been elected to membership of the National Academy of Medicine.

Dr. Florencio de Abreu, director of the Central Army Hospital of Rio de Janeiro, has been elected president of the Brazilian Academy of Military Medicine.

A special course in cancerology is being given at the St. Francisco de Assis Hospital at Rio de Janeiro; Drs. Doellinger da Graça, Vital Fontenelle, Morais Grey, Augusto Paulino and Rabello Filho e Armando Aguinaga are teaching this course.

A recent cablegram from Buenos Aires has announced that Dr. Aloysio de Castro, professor emeritus of medicine at the University of Rio de Janeiro and president of the National Academy of Medicine, has been honored as a guest at the Atheneum of History of Medicine of Argentina.

Dr. Eugene Kisch of the Hospital for Joint Diseases of Far Rockaway, New York, is spending several days at Rio de Janeiro as a guest of the Ataulfo de Paiva Foundation, an organization interested in the campaign against tuberculosis in this city. He has lectured at the National Academy of Medicine and at the Brazilian Tuberculosis Association on the treatment of osteoarticular tuberculosis.

Dr. Ovidio Meira, director of the St. Zacarias Children's Hospital of Rio de Janeiro, died at the age of 64. He was one of the leading orthopedists of the country.

Marriages

CHARLES L. WILLIAMS JR., P. A. S., U. S. Public Health Service, Ann Arbor, Mich., to Miss Alice Griesemer of Reading, Pa., October 14.

ROBERT W. MACKIE of Rockville Centre, N. Y., to Miss Lidie McWhinney Smith of Lawrence in South Mills, N. C., October 14.

VERNON HUTTON JR., Nashville, Tenn., to Miss Margaret Helen Turner in Hattiesburg, Miss., October 15.

E. DAVID BLECHMAN, Newport News, Va., to Miss Carolyn Hess of New York, November 30.

SIDNEY GOVER to Miss Ray Katz, both of New York, November 11.

Deaths

Benjamin F. Bailey ✠ Lincoln, Neb.; Hahnemann Medical College of Philadelphia, 1881; member, House of Delegates, American Medical Association, 1930-1937; past president of the Nebraska State Medical Association, Lancaster County Medical Society, state board of health, American Institute of Homeopathy, Nebraska State Homeopathic Medical Society, the American Interprofessional Institute, Northwest Regional Conference, Council of Social Agencies and the Lincoln board of education; interstate supervisor of education of the draft, U. S. P. H. S., in the last months of World War I for Nebraska, Iowa, Wisconsin, Minnesota, North Dakota and South Dakota; director of the First National Bank and Union Loan and Savings Association; past president of the Lincoln and Nebraska Society, Sons of the American Revolution and the Lincoln Chamber of Commerce; for twenty years president of the Lincoln and Lancaster County American Red Cross; formerly trustee of the Y. M. C. A.; president and chief of staff, Green Gables, Dr. Benjamin F. Bailey Sanatorium, which he established in 1901; joint author of "Present Status of Pediatrics"; served as chairman of the committee on journal and publication, Nebraska State Medical Association; died October 31, aged 84, of cerebral hemorrhage.

Benjamin Franklin Buzby ✠ Narberth, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1914; formerly instructor in surgery at his alma mater; specialist certified by the American Board of Orthopaedic Surgery, Inc.; past president of the Camden County Medical Society; member of the American Academy of Orthopaedic Surgeons and Philadelphia Academy of Surgery; past president of the Philadelphia Orthopedic Club; fellow of the American College of Surgeons; served overseas as a captain in the medical corps of the U. S. Army during World War I; on the courtesy staffs of the Bryn Mawr Hospital, Bryn Mawr, Pa., and the Chestnut Hill Hospital, Germantown, Pa.; consulting orthopedist, Underwood Hospital, Woodbury, N. J., and Camden County institutions, Lakeland, N. J.; chief of orthopedic service at the Burlington County Hospital, Mount Holly, N. J., Germantown Dispensary and Hospital, Philadelphia, and the Cooper Hospital, Camden, N. J., where he died October 22, aged 53, of acute lymphatic leukemia.

Ralph Clinton Cupler, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; also a pharmacist; fellow of the American College of Surgeons; for many years a member of the Chicago Surgical Society; life member of the Surgical Society of Rochester, Minn.; captain in the medical corps of the U. S. Army during World War I; formerly demonstrator of operative surgery and anatomy at the Chicago Policlinic; formerly professor of clinical surgery at the Bennett Medical College and the Chicago College of Medicine and Surgery; surgeon at St. Anthony's Hospital from 1905 to 1933 and in 1903 gynecologist; in 1903 member of the associate staff at Cook County Hospital; surgeon for the Illinois Central Railroad; died in Wilmette, Ill., October 24, aged 65, of coronary occlusion.

Harold Eliphalet Hoyt, Long Island City, N. Y.; Albany Medical College, Albany, 1904; member of the American Medical Association and the American Psychiatric Association; served on the faculty of the New York Homeopathic Medical School; veteran of the Spanish-American War; captain in the medical corps of the U. S. Army during World War I; formerly physician in charge of Fitch's Home for Soldiers, Noroton Heights, Conn.; served as resident psychiatrist at Blythewood, Greenwich, Conn., on the staff of West Hill Sanitarium, New York, and as assistant attending and associate attending neurologist at the Metropolitan Hospital, New York; a member of the staff of the River Crest Sanitarium, Astoria, since 1933 and physician in charge since 1935; died in St. John's Long Island City Hospital October 12, aged 66, of carcinoma.

Sterling B. Taylor, Columbus, Ohio; Starling Medical College, Columbus, 1890; member of the American Medical Association; fellow of the American College of Surgeons; in 1939 retired as local surgeon for the New York Central Railroad; in 1934 president of the American Association of Railway Surgeons; lecturer on anatomy at the Ohio Medical University from 1892 to 1899, Starling Medical College from 1903 to 1906 and Starling-Ohio Medical College, 1907-1908; served as major in the medical corps of the Ohio National Guard; on the staff of the Grant Hospital; died in St. Petersburg, Fla., September 21, aged 75, of coronary heart disease.

Antonio Lagorio, Chicago; Rush Medical College, Chicago, 1879; founder and director of the Pasteur Institute; member and president of the board of directors of the Chicago Public Library from 1906 to 1917; served as trustee of the House of Correction; received the Italian Cross of Chevalier and the silver medal of the Italian Red Cross and in 1922 the Order of the Grand Knight of the Crown of Italy; received the honorary LL.D. from St. Ignatius College 1907; said to be the first to bring the Pasteur treatment to the United States fifty-five years ago; died in the Columbus Hospital November 26, aged 87, of diabetes mellitus.

George Sloan Dixon, New York; Bellevue Hospital Medical College, New York, 1885; member of the American Medical Association, the American Academy of Ophthalmology and Otolaryngology and the American College of Radiology; specialist certified by the American Board of Radiology; formerly instructor of otology at the Columbia University College of Physicians and Surgeons and professor of roentgenology at the School of Ophthalmology and Otology, New York; president of the New York Roentgen Society in 1924; on the staff of the New York Eye and Ear Infirmary from 1893 to 1935; died October 9, aged 91, of carcinoma of the throat.

Charles Atsatt Sparrow ✠ Worcester, Mass.; Harvard Medical School, Boston, 1910; member of the American Academy of Pediatrics and the New England Pediatric Society; past president of the Worcester District Medical Society and councilor of the Massachusetts Medical Society; chief, pediatric service, Memorial Hospital, Worcester, and consultant to the Milford Hospital, Milford; chief medical officer of Civilian Defense, Worcester District; an associate editor of the *Worcester Medical News;* died September 20, aged 60, of pulmonary embolism and coronary occlusion.

Eugene Hertel Vachon, Hartford, Conn.; University of Montreal Faculty of Medicine, Montreal, Que., Canada, 1941; served internships at Hotel-Dieu de St. Joseph, Montreal, St. Jean de Dieu Hospital, Gamelin, Que., and the Hopital St. Justine, Montreal, Que.; served a residency in medicine at the Middlesex Hospital, Middletown, and at the State Veterans' Hospital in Rocky Hill; formerly in charge of anesthesia at the Davis Memorial Hospital, Elkins, W. Va.; on the staff of St. Francis Hospital, where he died September 25, aged 35, of coronary occlusion.

Charles Baker Adams, New York; Columbia University College of Physicians and Surgeons, New York, 1900; served on the staffs of the New York, Bellevue and Post-Graduate hospitals; died in the Columbus Hospital October 18, aged 70.

Jesse Curtis Akins, Forreston, Ill.; Barnes Medical College, St. Louis, 1899; member of the American Medical Association; on the staffs of the Deaconess and St. Francis hospitals, Freeport; for many years coroner of Ogle County; president of the White Oak Cemetery Association; died October 4, aged 75, of cardiac decompensation and uremia.

Sidney Watson Badcon, Ogden, Utah; Northwestern University Medical School, Chicago, 1912; member of the American Medical Association; served an internship at the Thomas D. Dee Memorial Hospital, where he had been on the staff and for two years president of the board; county physician; died in Samaritan Hospital, Denver, October 7, aged 73, of carcinoma of the prostate.

Vincent A. Ball ✠ Tonawanda, N. Y.; University of Buffalo School of Medicine, 1921; died in the De Graff Memorial Hospital, North Tonawanda, October 11, aged 48, of coronary occlusion.

Abram James Barker ✠ Torrington, Conn.; Bellevue Hospital Medical College, New York, 1897; past president of the Litchfield County Medical Society; member of the draft medical advisory board during World War I; surgeon for the American Brass Mill for many years; on the consulting staff of the Charlotte Hungerford Hospital, where he died October 2, aged 76, of coronary thrombosis and chronic valvular disease.

Lyman Guy Barton ✠ Plattsburg, N. Y.; Bellevue Hospital Medical College, New York, 1891; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; devised Barton forceps, skull tongs and other instruments; on the staff of Champlain Valley and Physicians hospitals; died November 21, aged 78, of coronary occlusion.

Edward I. Brown, St. Paul; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1900; member of the American Medical Association; on the staff of the Bethesda Hospital, where he died October 8, aged 75, of cerebral hemorrhage.

Thomas David Brown, Ogdensburg, N. Y.; Bellevue Hospital Medical College, New York, 1898; died October 6, aged 71, of coronary occlusion.

Romulus S. Buckland ✠ Baraga, Mich.; Fort Wayne College of Medicine, Fort Wayne, Ind., 1892; formerly associated with the Indian Service and superintendent of the Mackinac School; formerly health officer of Baraga Village; on the staff of St. Joseph's Hospital, Hancock; the Buckland Athletic Field at Baraga High School bears his name in recognition of his many contributions to the community; for many years chairman of the Baraga County Republican Committee; died October 13, aged 78.

Elliot T. Bush ✠ Elmira, N. Y.; University of Buffalo School of Medicine, 1903; past president of the Chemung County Medical Society; member of the American Urological Association; fellow of the American College of Surgeons; for many years honorary member of the Rotary Club; on the staffs of St. Joseph's Hospital and the Arnot-Ogden Hospital, where he died October 12, aged 64.

James Clyde Butler, Hutchinson, Kan.; Tennessee Medical College, Knoxville, 1894; member of the American Medical Association; formerly surgeon to the National Soldiers' Home in Tennessee; at one time associated with the Dykes Hospital in Stafford; served during World War I; died November 14, aged 73.

Victor Warren Byrnes, Durant, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; past president of the Cedar County Medical Society; died October 16, aged 70, of coronary thrombosis.

Andrew Roscoe Carrigan ✠ Manchester, Ohio; Kentucky School of Medicine, Louisville, 1903; served as a member of the Adams County Board of Health; died October 16, aged 64, of heart disease.

Harry X. Cline, Marion, Ill.; Washington University School of Medicine, St. Louis, 1905; veteran of the Spanish American War and World War I; died October 15, aged 66, of coronary thrombosis.

Edward W. Cummins, Harrisburg, Ill.; St. Louis University School of Medicine, 1906; member of the American Medical Association; served twice as president of the Saline County Medical Society; president of the board of the Saline County Tuberculosis Society; for many years member of the city school board, director of the First National Bank and physician for the Wasson Coal Company; formerly commissioner and city and county health officer; served during World War I; died October 5, aged 66, of lymphosarcoma.

Thomas Ridley Currie ✠ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1894; on the staffs of St. Christopher's and Northeastern hospitals; died October 10, aged 79, of ruptured aneurysm of the abdominal aorta and generalized arteriosclerosis.

Oscar Eisinger ✠ Cleveland; Medizinische Fakultät der Universität Wien, Austria, 1915; a captain in the Austrian army during World War I; medical examiner for the induction board of Cleveland, World War II; on the staff of the Polyclinic Hospital; died October 4, aged 53, of coronary thrombosis.

Omar F. Elder, Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1909; associate member of the Medical Association of Georgia; died October 25, aged 58, of coronary sclerosis.

Marcus Samuel Fletcher ✠ Georgetown, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; on the staffs of the Lakeview and St. Elizabeth hospitals in Danville; served during World War I; for many years a member of the school board; died October 9, aged 75, of carcinoma.

Clark Barrows Hatch ✠ Newark, Ohio; Starling-Ohio Medical College, Columbus, 1904; member of the American Academy of Ophthalmology and Otolaryngology; an examiner for the draft board during World War I; formerly city health officer; past president of the Rotary Club and the Y. M. C. A. board of directors; on the staff of the Newark City Hospital, where he died October 20, aged 65, of acute pulmonary edema.

Samuel Barth Hirschberg, Los Angeles; Detroit College of Medicine, 1908; served as a captain in the medical corps of the U. S. Army during World War I; formerly director of the Letterman General Hospital, San Francisco, superintendent of the Mount Zion Hospital, San Francisco, and the Chicago-Winfield Tuberculosis Sanitarium, Winfield, Ill., and medical director of the Beth Moses Hospital, Brooklyn; died October 5, aged 61, of carcinoma of the stomach.

Leonard D. Hoskins, Pineville, Ky.; Hospital College of Medicine, Louisville, 1903; member of the American Medical Association; died in Knoxville, Tenn., October 11, aged 71.

George P. Huddle, Stoutsville, Ohio; Starling Medical College, Columbus, 1888; died in the Lancaster Municipal Hospital, Lancaster, October 20, aged 82.

Carl Aaron Hyer ✠ Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1920; from 1924 to 1928 member of the teaching staff of the Ohio State University College of Medicine as an assistant in the department of medicine; for many years on the staff of the Mount Carmel Hospital; member of the local Rotary Club; died suddenly October 13, aged 52, of cerebral hemorrhage.

Raymond Delos Jamieson ✠ Racine, Wis.; Marquette University School of Medicine, Milwaukee, 1913; past president of the Racine County Medical Society; member of the executive staff at St. Mary's Hospital, where he served as roentgenologist for seven years and had been on the staff at St. Luke's Hospital; died October 7, aged 53, of heart disease.

Jacob Kaufmann ✠ New York; Kaiser-Wilhelms-Universität Medizinische Fakultät, Strassburg, Germany, 1885; formerly professor of clinical medicine at the Columbia University College of Physicians and Surgeons; member and past president of the American Gastro-Enterological Association; member of the American Association for the Advancement of Science; attending physician at the Lenox Hill Hospital from 1895 to 1925, when he became consultant, a position formerly held at the Beekman Hospital; died October 13, aged 84, of senility.

Frederick Krauss ✠ Elkins Park, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of St. Christopher's and Episcopal hospitals, Philadelphia, and the Abington Memorial Hospital, Abington, where he died October 9, aged 73.

Richard Vance Lynch ✠ Clarksburg, W. Va.; Eclectic Medical College, Cincinnati, 1910; past president of the Harrison County Medical Society; at one time physician for the Hutchinson Coal Company at Erie; physician for the Grasselli Chemical Company, Spelter; died November 13, aged 60, of heart disease.

John McCampbell, Morganton, N. C.; Baltimore Medical College, 1894; member of the American Medical Association and the American Psychiatric Association; chairman of the district medical board during World War I; retired in 1938 as superintendent of the State Hospital, a position he had held for many years; served as a member of the state eugenics board; died in the Davis Hospital, Statesville, November 5, aged 76, of carcinoma of the head of the pancreas.

Wallace Delos Russell, New Hartford, N. Y.; University of the City of New York Medical Department, New York, 1886; member of the American Medical Association; died September 27, aged 86, of generalized arteriosclerosis and heart disease.

Scott Ryerson ✠ Daggett, Calif.; University of Buffalo School of Medicine, 1931; specialist certified by the American Board of Surgery; diplomate of the National Board of Medical Examiners; fellow of the American College of Surgeons; served as assistant in surgery at his alma mater; formerly on the staffs of the Buffalo General and the Edward J. Meyer Memorial hospitals; died in Buffalo September 17, aged 35, of coronary thrombosis.

John Raymond Sheehan, Milwaukee; Chicago College of Medicine and Surgery, 1915; served during World War I; died in the Milwaukee County Hospital, Wauwatosa, September 28, aged 54, of acute peritonitis and perforated duodenal ulcer.

Arthur Edwin Shell ✠ Clinton, Ill.; University of Illinois College of Medicine, Chicago, 1915; served during World War I; in 1931 appointed district surgeon for the Illinois Terminal Railroad System and the Illinois Power and Light Corporation; died in St. James Hospital September 3, aged 55, of coronary thrombosis.

Charles Reynolds Sheridan, Detroit; University of Maryland School of Medicine, Baltimore, 1907; member of the American Medical Association; served as health officer of Hamtramck; on the staff of St. Francis Hospital; died October 3, aged 58, of heart disease.

John B. Slicer, Rising Sun, Md.; College of Physicians and Surgeons, Baltimore, 1884; formerly county coroner; died in the Union Hospital, Elkton, September 8, aged 86, of carcinoma of the liver.

Albert Godfrey Smith, Oskaloosa, Kan.; University Medical College of Kansas City, Mo., 1886; member of the American Medical Association; honorary member of the Shawnee County Medical Society; formerly mayor; served on the staff of Christ's Hospital, Topeka; died September 25, aged 84, of coronary thrombosis.

John Henry Smith ✠ Duke Center, Pa.; University of Pittsburgh School of Medicine, 1909; died in St. Francis Hospital, Olean, N. Y., September 3, aged 63, of acute peritonitis following perforation of colonic diverticula.

Matthew B. Smith, Fenton, Mich.; Saginaw Valley Medical College, Saginaw, 1898; formerly on the staffs of the Hurley and St. Joseph's hospitals, Flint; died September 27, aged 72, of heart disease.

Wayne Lawson Snyder, Brookville, Pa.; Jefferson Medical College of Philadelphia, 1905; member of the American Medical Association; fellow of the American College of Surgeons; served overseas during World War I; formerly on the staff of the Brookville Hospital; died September 23, aged 63, of coronary heart disease.

Chester A. Spitler ✠ Middletown, Ohio; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; served as city physician and health officer; for many years on the staff of the Middletown Hospital; died September 14, aged 66, of chondrosarcoma.

Guy N. Stonemetz, Fairfield, Ill.; St. Louis Medical College, 1885; for many years a druggist; died September 22, aged 81, of nephritis and senility.

Homer O. Strosnider, Keokuk, Iowa; Keokuk Medical College, College of Physicians and Surgeons, Keokuk, 1905; member of the American Medical Association; died September 29, aged 61, of pernicious anemia.

John Armstrong Sugg, McEwen, Tenn.; University of Nashville Medical Department, 1900; died September 1, aged 71.

Robert Elmer Summitt ✠ Gainesville, Fla.; Tulane University of Louisiana School of Medicine, New Orleans, 1926; served during World War I; member of the Alachua County Hospital staff and past president; died September 12, aged 51, of heart disease.

LIEUT. (JG) JOHN ARTHUR CLAPP (MC), U.S.N.R., 1914-1944

John Nelson Swartz ✠ Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; died September 27, aged 72, of congestive heart failure.

Green Benjamin Taylor, Cameron, Texas; Memphis (Tenn.) Hospital Medical College, 1900; past president and secretary of the Milam County Medical Society and president of the Central Texas District Medical Society; formerly vice president of the State Medical Association of Texas; for many years local oculist for the Santa Fe and Southern Pacific railroads; died September 2, aged 69, of coronary occlusion.

Alfred Teebor, Newark, N. J.; Medizinische Fakultät der Universität Wien, Austria, 1914; died September 23, aged 54, of coronary thrombosis.

Henson Foster Tomb, Johnstown, Pa.; Jefferson Medical College of Philadelphia, 1887; member of the American Medical Association; school physician; member of the consulting staff of the Conemaugh Valley Memorial Hospital, where he died September 15, aged 83, of carcinoma of the liver.

Rufus Henry Tomlinson, McKinnon, Tenn.; Vanderbilt University School of Medicine, Nashville, 1893; died in the Clarksville Hospital, Clarksville, September 27, aged 76, of heart disease.

J. Frank Van Voorhis, Rockford, Ill.; Bennett Medical College, Chicago, 1889; died in the Swedish-American Hospital September 17, aged 79, of cerebral hemorrhage.

George Van Voris Warner, Red Bank, N. J.; Albany Medical College, Albany, 1902; past president of the Monmouth County Medical Society; served as president of the Monmouth County Mosquito Extermination Commission; on the staffs of the Dr. E. C. Hazard Hospital, Long Branch, and the Royal Pines Hospital, Pinewald; died October 9, aged 67.

Lloyd Cyrus Warren ✠ Franklin, N. Y.; Baltimore Medical College, 1911; a first lieutenant in the medical corps of the U. S. Army during World War I; since 1940 medical examiner for the Selective Service Board at Walton; served as school physician, health officer of the town of Franklin, and coroner of Delaware County; on the staffs of the Aurelia Osborn Fox Memorial Hospital, Oneonta, and The Hospital, Sidney; died September 14, aged 61, of coronary occlusion.

Benjamin Weiner, Pittsburgh; University of Pittsburgh School of Medicine, 1909; served during World War I; died August 9, aged 56, of carcinoma of the lung.

Milton Madison Wells ✠ Fairland, Ind.; Medical College of Indiana, Indianapolis, 1901; served during World War I; for many years Brandywine township trustee; died in the W. S. Major Hospital, Shelbyville, October 12, aged 73.

Frank Kemper Westfall, Prairie City, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1903; at one time on the staff of the Phelps Hospital, Macomb; died September 16, aged 64.

Edgar Allen Widber, Monroe Township, N. J.; University of Vermont College of Medicine, Burlington, 1894; died September 28, aged 83, of arteriosclerotic heart disease.

LIEUT. (JG) GENE W. HAIR (MC), U.S.N.R., 1908-1944

James Salmon Wilkinson, Philadelphia; Medico-Chirurgical College of Philadelphia, 1906; on the courtesy staffs of the Germantown and Chestnut Hill hospitals; died October 3, aged 61, of nephritis.

Lucius Gould Wright, Chicago; John A. Creighton Medical College, Omaha, 1910; served during World War I; died September 23, aged 69, of atrophic cirrhosis of the liver.

Herbert Leroy York, Melrose, Mass.; Harvard Medical School, Boston, 1899; retired druggist; died in the Corey Hill Hospital, Brookline, September 25, aged 70, of coronary occlusion.

Everett Thomas Zaring ✠ Terre Haute, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; member of the American Society of Anesthetists; deputy coroner of Vigo County; served as secretary for the city board of health; formerly contagious disease physician for the city; on the staff of the Union Hospital; died September 20, aged 61, of cerebral hemorrhage.

KILLED IN ACTION

John Arthur Clapp, Chicago; University of Illinois College of Medicine, Chicago, 1942; served an internship at the St. Louis City Hospital, St. Louis, and the Evangelical Hospital in Chicago; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on Oct. 14, 1942; began active duty in July 1943; died in the Pacific area July 21, aged 29, of fragment chest wound.

Gene W. Hair, Buffalo; University of Buffalo School of Medicine, 1941; member of the American Medical Association; diplomate of the National Board of Medical Examiners; interned at the Buffalo Hospital of the Sisters of Charity; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on March 12, 1943; medical officer on a Landing Ship Tank and had been in North Africa, Sicily, Salerno and England; killed in action off the coast of France June 9, aged 35.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices or cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Basseran with Cascara.—The William S. Merrell Company, Cincinnati, entered into a stipulation with the Federal Trade Commission in March 1944, agreeing to discontinue any advertisement which did not reveal that the product should not be used when symptoms of appendicitis, such as abdominal pain or nausea, are present; provided, however, that the advertisements need only contain the statement, "Caution: Use Only as Directed," if the label directions carry a warning to the same effect.

Green's Reliable Restorer.—This is put out by an A. J. Green, trading as Green's Hair Hospital, Clarksburg, W. Va. In March 1944 he stipulated with the Federal Trade Commission that he would cease representing that his product is not a dye or stain and is harmless; that it corrects gray hair or, through use of the term "restorer" or by any other means, that it restores the original color to the hair; that it grows or promotes the growth of hair; that it stops the hair from falling out or constitutes a cure or remedy for, or has any value in treating, dandruff or contagious eruptions, in excess of the removal of dandruff scales.

Gro-Fas Hair Balm Formula, "Formula For Treating Gray Hair," and Gro-Fas Hair Treatment.—These are sold by an H. S. Cobb, trading as the Cobb Laboratories, Philadelphia. In a stipulation that he entered into with the Federal Trade Commission in March 1944, he agreed, in connection with the sale of Gro-Fas Hair Treatment and the formulas, to cease representing that the product itself or one compounded in accordance with his formulas, will nourish or feed the scalp or clear it of sore rash or tetter itch. Further, he agreed to cease representing, by use of the term "Gro-Fas," that the product of this name or one compounded from his formulas, will cause the hair to grow longer or in any way affect the growth of the hair. Also, he stipulated that he would cease using the word "Laboratory" in his trade name or business, when he does not own, operate and control a laboratory where research work in connection with his business is conducted by trained technicians.

Naturaltone.—This is a product of a Katherine E. Martin, trading as Naturaltone Company, Chicago. According to a stipulation that she entered into with the Federal Trade Commission in March 1944, she will no longer represent, by use of the word "restorer" or any other means, that the preparation restores the original color to the hair; that it is not a dye, but a gray hair corrective and banishes gray hair; that it makes the hair soft and benefits the scalp, or is a cure or remedy for dandruff or has value in treating it in excess of removing dandruff scales.

Sabetal.—This is put out by Isaac Masarsky, trading as Hillcrest Laboratories, Spring Valley, N. Y. According to a stipulation that he entered into with the Federal Trade Commission in March 1944, he will no longer represent that the product has any beneficial effect on psoriasis, eczema, or any other external skin irritation other than temporarily relieving the itching incident thereto, or aids in the removal of loose epidermic scales caused by such ailments. It was further agreed to discontinue any advertisement which did not reveal that Sabetal contains coal tar and oxyquinoline sulfate and that its use may cause irritation and in such cases should be discontinued. Masarsky was permitted, however, to use the simple advertising statement, "Caution: Use Only as Directed," provided that the labeling carried the same warning.

Viet.—This is a product of the Cerophyl Laboratories, Inc., of Kansas City, Mo. In March 1944 this concern and the Potts-Turnbull Advertising Company of the same city stipulated with the Federal Trade Commission that they would no longer represent that Viet will relieve or correct such conditions as loss of beauty in skin or eyes, nervousness, undue fatigue, stomach or intestinal trouble, or be beneficial in treating nervous irritability or run-down condition. The Cerophyl concern and the Campbell-Ewald Company of Detroit, another advertising firm, stipulated with the Federal Trade Commission to discontinue any advertisement which represented that Viet would help tone or benefit the nervous system, regulate or normalize elimination, reduce susceptibility to colds, build up resistance to illness or disease, or correct some other conditions. They further agreed to cease representing that the use of Viet will be helpful for all conditions resulting from vitamin deficiency, that the "grass juice factor" in the preparation is essential in nutrition, or that chlorophyll is beneficial or essential in the human diet.

Vilches Cosmetics.—These are put out by one Walter Gutheim of New York, who trades under the name Mrs. E. Vilches. In a stipulation that he entered into with the Federal Trade Commission in March 1944, Gutheim agreed to discontinue the following advertising misrepresentations: That Vilches Hair Restoro will restore the original color to the hair, nourish the hair root, promote hair growth or prevent dandruff and falling hair, is not a dye and is harmless; that Vilches Special Hair Tonic will check falling hair; that Vilches Cleansing Cream will cleanse the skin more thoroughly than soap and water; that Vilches Burdock Root Ointment is a cure or remedy for, or has value in the treatment of dandruff, itching scalp, falling hair, eczema and other scalp diseases, or will promote the growth of hair; or that Vilches Creams, Lotions, Astringents and Powders will nourish the skin, give it a youthful appearance or rid it of wrinkles. Gutheim further stipulated that he would cease representing, by use of the words "Skin Food" in the brand name of Vilches Excellent Skin Food, or in any other manner, that this product will nourish the skin; or, by use of the words "Pore Cleansing" in the brand name of Vilches Pore Cleansing Cream, or by any other means, that this cream will cleanse the pores; by use of the phrase "Freckle Remover" in the brand name of Vilches Freckle Remover, or otherwise, that the preparation will remove freckles; by use of the words "Pimple and Blackhead Cream" in the brand name of Vilches Pimple and Blackhead Cream, or in any other manner, that this product will clear the skin of pimples and blackheads.

Vitamelk Enriched Bread.—This product, put out by Vitamelk Bread, Inc., is reported by the Federal Trade Commission to be enriched with a vitamin powder concentrate manufactured by Dawe's Vitamelk Laboratories, Inc., also of Chicago. In March 1944 the two corporations, which are said to have the same stockholders and officers, stipulated with the Federal Trade Commission to discontinue the following misrepresentations: That this bread, by reason of its impregnation with Vitamelk concentrate, provides a competent treatment or efficient remedy for bodily conditions revealed by such symptoms as nervousness, sluggishness, loss of youthful appearance, digestive disturbances, anemia, low vitality, tooth decay, mouth and gum inflammations, insomnia or loss of weight and strength, among other disorders; that the vitamin and mineral enrichment of Vitamelk Bread exceeds that of standard enriched bread; that the ordinary diet is apt to lack the necessary amounts of essential vitamins, or that it is usually impossible to obtain the requisite quantities of vitamins in the ordinary diet; that for the maintenance of bountiful health "only a reasonable amount" of additional vitamins is required for consumers of Vitamelk bread, or that the product may be relied on to provide the minimum daily requirements of the essential vitamins and minerals when taken in customary quantities. Further, the two concerns agreed to cease designating the alleged functions of certain vitamins and minerals, such as calling vitamin B_1 the "calm nerve" vitamin, iron the "red-blood" mineral, and calcium the "good teeth" mineral.

Woda Polska (Polish Water).—This is put out by Anthony Worzalla, Rose Worzalla Imber, Evelyn Worzalla Witkowski and Walter S. Worzalla, trading as Imico, Stevens Point, Wis. According to a stipulation that they entered into with the Federal Trade Commission in March 1944, they will cease representing, by the use of the word "restores" or any other means, that their dye restores the original color to hair, eliminates or corrects gray hair, or is harmless.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Hodgkin's Disease Allegedly Aggravated by Trauma.—Hall apparently suffered from Hodgkin's disease prior to the industrial accident here in question. In the course of his employment he operated what is referred to in the opinion here reported as an "oil servicing unit," sitting on a seat from which he could reach various levers. The unit was tied down by a chain to a cement corner 3 or 4 feet high to keep it from slipping. One day in March 1942 this chain broke, permitting the unit to move forward a few feet against the corner of a derrick and the seat on which Hall was sitting to be thrown up about 8 inches. This caused Hall to be thrown off the seat and on to the ground about 4 or 5 feet below. He was severely bruised on his left hip, on the calf of his left leg and on his left arm between the shoulder and the elbow. The next morning he complained of soreness and stiffness in his neck, but there was no bruise visible in that area. While his injuries "troubled him with his work," he continued to work until July 26. Less than a week after the industrial accident a lump formed in the gland under his left jaw, increasing in size until it was about 3 inches long and 1½ inches high. It caused him no pain or particular inconvenience for a few months but some time in June became troublesome. In August 1942 he was taken to a hospital, where the gland was removed by Dr. Chesky, who made a diagnosis of Hodgkin's disease. The workman died the following February from that disease. His widow instituted compensation proceedings under the workmen's compensation act of Kansas, claiming a causal connection between the industrial accident and Hall's death. From an order of the compensation commissioner denying com-

pensation, the widow appealed to the district court, McPherson County, which found that Hall had been suffering from Hodgkin's disease prior to the industrial accident and that the progress of that disease was aggravated and accelerated by the industrial accident, which in turn resulted in Hall's death. The court accordingly awarded compensation, and the employer and his insurer appealed to the Supreme Court of Kansas.

The appellants contended that there was no competent evidence before the trial court to support a finding that the progress of Hodgkin's disease in Hall was hastened, aggravated and accelerated by the industrial accident, thereby hastening Hall's death. This, said the Supreme Court, presents a question of law. In deciding the question this court does not weigh the evidence but only examines the record to see if there is substantial, competent evidence to support the findings of the trial court and in so doing ignores controverting evidence which may not have been given credence. We have no occasion here to write a thesis on Hodgkin's disease. However, from the evidence in this case and from pertinent authorities it appears that Hodgkin's disease is characterized by an enlargement of the lymphatic glands, accompanied by progressive anemia and terminating in a fatal result. It most frequently shows itself in the glands of the neck but may involve other glands, as those under the arm, the abdomen or the groin. Sometimes the spleen is affected, and less frequently the liver and bone marrow. As the gland enlarges a real change takes place in the cell structure. Sometimes this suggests an unusual variety of tuberculosis of the lymphatic glands; at other times it is thought to be identical with one variety of a malignant tumor. The disease begins slowly and without pain, and one may be afflicted with the disease for several months or even for several years without knowing it. The cause of the disease is unknown. The progress in some cases has been slowed by treatment with radium or roentgen therapy. The employer and his insurance carrier relied on a quotation from Gray's "Attorneys' Textbook of Medicine," page 526 (ed. 2, p. 789) to the effect that medical authorities agree that Hodgkin's disease cannot be either caused or aggravated by injury. That thought, continued the court, is expressed by the author of that textbook in two other places in his article on Hodgkin's disease, but no medical authority is cited to that effect nor is such medical authority cited by the employer and his insurance carrier and our own research discloses none. Without regard to the correctness of the authority so relied on by the appellants, the trial court was compelled to decide this case on the evidence before it, and our sole question is whether or not there was substantial, competent evidence to sustain the finding and judgment of the trial court. On that point the best that can be said for the appellants is that the evidence was conflicting. Five physicians testified. One of them stated that he did not know the cause of Hodgkin's disease, for which reason he would express no view as to whether it might be caused or aggravated by trauma. Two physicians testified that in their judgment trauma would injure tissues affected by Hodgkin's disease just as readily as it would injure healthy tissue or tissue affected by any other disease and in their opinion that, since Hall suffered pain and discomfort in his neck the morning following the industrial accident and a lump formed in a gland in the neck within a few days after the accident, it was reasonable to suppose that the injury had something to do with it and that probably the injury aggravated the disease and shortened the life of the workman. Two of the physicians gave it as their opinion that Hodgkin's disease could not be aggravated by trauma, basing their testimony largely on the fact that "the medical authorities do not mention trauma as either a cause or an aggravation of the disease." One of the latter physicians testified that he had never had a case in which he was sure that the disease had been aggravated by trauma. The weight to be given to this evidence, concluded the court, was for the trial court and not for this court on review. It is well settled, of course, that an injury which aggravates an existing disease or accelerates the death of a workman is compensable. The employer and his carrier, however, argued that the medical testimony relied on by the trial court to show a causal connection between the industrial accident and the ensuing death went no further than to indicate that it was possible that the disease was aggravated by the accident and that therefore the judgment of the court was founded on speculation or surmise. We think, answered the court, however, that the evidence is not open to that interpretation but went further to the effect that the injury probably had the effect of aggravating and accelerating the disease.

Accordingly the award of compensation for Hall's death was affirmed.—*Hall v. Kornfeld-Harper Well Servicing Co., 151 P. (2d) 688 (Kan. 1944).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in THE JOURNAL, December 9, page 979.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, March. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA: * Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Oral.* Los Angeles, Jan. 21. *Written.* Los Angeles, March 5-8. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO: * Denver, Jan. 2-5. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

HAWAII: Honolulu, Jan. 8-11. Sec., Dr. J. A. Morgan, 55 Young Bldg., Honolulu.

IDAHO: Boise, Jan. 8-11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 2-4. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Jan. 3-5. Exec. Sec., Board of Medical Registration and Examination, Miss Ruth V. Kirk, 301 State House, Indianapolis 4.

MINNESOTA: * Minneapolis, Jan. 16-18. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

NEW HAMPSHIRE: Concord, March 8-9. Sec., Board of Registration in Medicine, Dr. D. G. Smith, 77 Main St., Nashua.

NEW MEXICO: * Santa Fe, April 9-10. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 29-Feb. 1. Chief, Mr. H. L. Field, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OHIO: *Endorsement.* Columbus, Jan. 9. *Examination.* Columbus, June. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * Portland, Jan. 24-27. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland 4.

RHODE ISLAND: * Providence, Jan. 4-5. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blandina St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 16-17. Sec., Medical Licensure, State Board of Health, Dr. G. Cottam, Pierre.

TEXAS: Dallas, Dec. 19-21. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: * Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: * Seattle, Jan. 15-17. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

WEST VIRGINIA: Charleston, Feb. 26-28. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Madison, Jan. 9-11. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Feb. 5-6. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Feb. 10. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Apr. 23-24. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: DeLand, June 1. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Jan. 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Jan. 12-13. Sec., Miss Eloise Le Beau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Jan. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, Jan. 9-10. Dir., Bureau of Examining Boards, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Santa Fe, Feb. 12. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

OREGON: Portland, March 3. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

TENNESSEE: Memphis and Nashville, Dec. 18-19. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

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American Journal of Physiology, Baltimore

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Comparison of Renotrophic with Androgenic Activity of Various Steroids. C. D. Kochakian.—p. 315.
Visual Thresholds as Index of Physiologic Imbalance During Anoxia. R. A. McFarland, M. H. Halperin and J. I. Niven.—p. 328.
Fatigue of Depressor Reflex Harriet Mylander Maling.—p. 350.
Effects of Infusing Glycine and of Varying Dietary Protein Intake on Renal Hemodynamics in Dog. R. F. Pitts.—p. 355.
Cardiovascular Changes Resulting From Severe Scalds. I. H. Page. —p. 366.
Response of Mammalian Smooth Muscle to Oxygen at High Pressure and Its Possible Relationship to Oxygen Poisoning of Respiratory Enzyme Systems. J. W. Bean and D. F. Bohr.—p. 379.
Oxygen Consumption of Eye Muscles of Thyroidectomized and Thyroxin Injected Guinea Pigs. G. K. Smelser.—p. 396.
Experimental Production of Hyperchromic Anemia in Dogs Which is Responsive to Anti-Pernicious Anemia Treatment. J. E. Davis. —p. 402.
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Reflexes in Anterior Tibial Muscle After Cord Asphyxiation. A. van Harreveld.—p. 428.
Induced Variations in Cell Fluid Volume in Study of Shifts of Body Fluid. C. T. Ashworth and A. J. Gill.—p. 435.
Histochemical Changes in Kidney During Diuresis and Dehydration. J. M. Weller.—p. 443.
Mechanisms Underlying Electrocardiographic Changes Observed in Anoxia. A. S. Harris and W. C. Randall.—p. 452.

Annals of Surgery, Philadelphia

120: 257-416 (Sept.) 1944

The State of the American Surgical Association. F. A. Coller.—p. 257.
*Surgical Management of Wounded in Mediterranean Theater at Time of Fall of Rome. E. D. Churchill.—p. 268.
Vascular Injuries of Warfare. D. C. Elkin.—p. 284.
*Use of Penicillin in Surgical Infections. J. S. Lockwood, W. L. White and F. D. Murphy.—p. 311.
Acute Starvation Following Operation or Injury, with Special Reference to Caloric and Protein Needs. R. Elman.—p. 350.
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Study of Interrelationship of Salt Solutions, Serum and Defibrinated Blood in Treatment of Severely Scalded, Anesthetized Dogs. C. A. Moyer, F. A. Coller, Vivian Iob, H. H. Vaughan and Doris Marty. —p. 367.
Comparison of Various Types of Local Treatment in Controlled Series of Experimental Burns in Human Volunteers J. A. Dingwall and W. DeW. Andrus.—p. 377.
Tannic Acid and Treatment of Burns: An Obsequy. R. D. McClure, C. R. Lam and R. Romence.—p. 387.
Surgical Treatment of Carcinoma of Body of Pancreas. A. Brunschwig.—p. 406.

Surgical Management of Wounded in Mediterranean Theater.—A highly significant and far reaching advance in military surgery has taken place in the base hospitals with the development of what may be called "reparative surgery." Reparative surgery, according to Churchill, is not to be confused with the reconstructive surgery of the zone of the interior. Reparative surgery is designed to prevent or cut short wound infection. If the initial wound operation has been a complete one, wounds of the soft parts may be closed by suture on or after the fourth day. The dressing applied in the evacuation hospital is removed under aseptic precautions in an operating room of a general hospital at the base. Following closure, the part is immobilized preferably by a light plaster encasement or, if this is not practical, by bed rest. Decision to close a wound by suture is based solely on an appraisal of the gross appearance at the time of removal of the dressing. Preliminary bacteriologic analysis of the flora of the wound does not provide information pertinent to this decision or allow the prediction of the result. "Clean" wounds that heal by first intention after delayed closure may show a profuse and varied flora, both anaerobic and aerobic. It is estimated that during the Italian campaign alone at least 25,000 wounds of the soft parts have been closed on the basis of gross appearance only. Healing has resulted in approximately 95 per cent, and no loss of life or limb or serious complications have been reported. Four to ten days is the "golden period" to close wounds, reduce and fix fractures, remove retained missiles and carry out other procedures to prevent or abort infection. It is a satisfaction to note the contrast between the present concept of wound management and the doctrines in vogue scarcely a year ago. The closed plaster management of wounds and fractures was designed to conserve life but exacted a high price in skeletal and soft part deformity. Its use is now limited to certain cases with established infection of bone or with massive defects of soft parts compounding a fracture site. Resuscitation measures that relied on plasma alone to compensate for loss of whole blood prolonged life but tied the hands of the surgeon in the performance of life saving surgery.

Penicillin in Surgical Infections.—Lockwood and his associates of the Subcommittee on Infected Wounds and Burns of the National Research Council report a series of 400 cases treated with penicillin. The drug when administered systemically modified the course of most infections in which the causative organism is sensitive to penicillin in vitro. The magnitude of the effect in individual cases may be classified as follows: (*a*) Dramatic curative responses in disseminated sepsis, particularly where circulation in localized distributing foci is adequate to effect contact between drug and bacteria. In such cases surgical treatment which would have seemed unavoidable in the past may, with penicillin, be postponed or avoided altogether. (*b*) Favorable responses characterized by subsidence of toxemia, correction of anemia, rapid healing of infected or seriously contaminated wounds, and elimination of infection within the pleural cavity or joints. (*c*) Failures, particularly where the organism is insensitive, or where the lesion under treatment is attributable only in part or not at all to the persistent activity of penicillin sensitive bacteria, and under conditions in which penicillin cannot be brought to the infected area because of poor circulation or limited transport of the drug. Local penicillin therapy needs further study but is yielding encouraging results in special cases. Just as with the sulfonamides, the use of penicillin requires a thorough redefinition of the indications for, and objectives in, the employment of surgery in treatment of localized infections. Careful bacteriologic studies are essential if penicillin is to be used with maximal effectiveness. As the supply of penicillin increases it will be possible through careful observation of cases, and the use of controls whenever practical, to reach a more accurate definition of the scope and limitations of penicillin than is yet possible.

Archives of Neurology and Psychiatry, Chicago

52: 163-254 (Sept.) 1944

Relation of Abnormal Collections of Cells in Posterior Medullary Velum of Cerebellum to Origin of Medulloblastoma. J. Raaf and J. W. Kernohan.—p. 163.
*Phlebostasis and Phlebothrombosis of Brain in Newborn and in Early Childhood. O. Marburg and L. Casamajor.—p. 170.
Experimental Production of Focal Epilepsy. B. L. Bacella, N. Kopeloff, S. E. Barrera and L. M. Kopeloff.—p. 189.
Guide to Interviewing and Clinical Personality Study. J. C. Whitehorn.—p. 197.
Neuronal Disease Associated with Intracytoplasmic Inclusion Bodies. J. W. Papez.—p. 217.

Phlebothrombosis of Brain in the Newborn.—Marburg and Casamajor state that phlebothrombosis and phlebostasis are frequently the cause of severe disintegration of the brain in early childhood. The site of the lesions corresponds to the drainage areas of the veins. In the 2 cases reported the site corresponded to the drainage areas of the vena cerebri magna and the sinus longitudinalis superior. But whereas in the first case only the drainage system of the vena terminalis anterior and the vena lateralis ventriculi was damaged, in the second case the other branches of the great cerebral vein were also affected except for the vena septi pellucidi and some branches draining the corpus callosum and the posterior part of the

superior frontal gyrus. This region was preserved in both cases. That other branches of the vena cerebri magna were affected in the second case is evidenced by the fact that the hippocampal region had not been spared, in contrast to the condition in the first case; the optic nerve showed atrophic changes and the choroid plexus was sclerotic. The pathologic changes are necrosis, malacia and serous perfusion, followed by total or partial destruction of the tissue, with sparing of the most resistant parts (glia) and destruction of the least resistant structures (myelin sheaths and axons). The repair depends on the degree of destruction: Complete destruction is followed by cyst formation, and incomplete destruction by sclerosis. The condition under discussion is closely related to diffuse sclerosis occurring in childhood, which to some extent is only the terminal stage of a phlebothrombotic or a phlebostatic state. The same relation seems to apply to a disease in lambs called "swayback." Cushing performed operations in 4 cases of cerebral hemorrhages caused by birth. Success was obtained in 2 of these. However, since surgical cure is impossible in cases with necrosis, malacia or serous perfusion, prevention is essential, which implies caution during pregnancy, delivery and early infancy.

Arizona Medicine, Phoenix

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Arkansas Medical Society Journal, Fort Smith

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Decreased Mutual Adhesiveness, Property of Cells from Squamous Cell Carcinomas. D. R. Coman.—p. 625.
Mode of Origin of Tumors: Solitary Localized Squamous Cell Growths of Skin. R. A. Willis.—p. 630.
Distribution of Iron and Copper in Malignant Neoplastic Disease. K. W. Buchwald and Leona Hudson.—p. 645.

Endocrinology, Springfield, Ill.

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Effect of Sulfonamides and Thiourea Derivatives on Heart Rate and Organ Morphology. C. P. Leblond and H. E. Hoff.—p. 229.
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*Studies on Mechanism of Alloxan Diabetes. M. G. Goldner and G. Gomori.—p. 241.
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On Broodiness of Ring Doves Following Implants of Certain Steroid Hormones. O. Riddle and E. L. Lahr.—p. 255.
Action of Steroid Hormones on Mature Dove Testis. E. L. Lahr and O. Riddle.—p. 261.
Effect of Sex Hormones on Anemia Induced by Hemorrhage in Rat. Grace Finkelstein, A. S. Gordon and H. A. Charipper.—p. 267.

Mechanism of Alloxan Diabetes.—Goldner and Gomori describe experiments on dogs which revealed that alloxan exerts its diabetogenic effect by a direct action on the pancreas. The early hyperglycemia after alloxan is not a causal factor in the development of diabetes. Even if a normal blood sugar is maintained for an initial period after alloxan injection, islet cell degeneration and diabetes develop. The initial hyperglycemia depends on the presence of an intact adrenal medulla. Alloxan does not inhibit or inactivate insulin. The transitory alloxan hypoglycemia is produced by insulin liberated from degenerating pancreatic islet cells. In alloxan diabetes the insulin content of the pancreas is greatly decreased. The diabetogenic action is a specific property of alloxan. None of the chemically related compounds tested have a similar effect on carbohydrate metabolism.

Georgia Medical Association Journal, Atlanta

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Hawaii Medical Journal, Honolulu

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Journal of Allergy, St. Louis

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Problem of Allergy at Army Air Forces Hospital: I. Respiratory Allergy (Hay Fever, Vasomotor Rhinitis and Bronchial Asthma). S. F. Hampton and H. Rand.—p. 355.

Journal of Lab. and Clinical Medicine, St. Louis

29:1001-1108 (Oct.) 1944

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Hematologic Complications of Therapy with Radioactive Phosphorus. L. A. Hempelmann Jr., E. H. Reinhard, C. V. Moore, Olga S. Bierbaum and J. Moore.—p. 1020.
Salmonella Food Infection in Military Personnel: Outbreak Caused by S. Oranienburg, S. Typhi Murium and S. Anatum. W. Greifinger and J. K. Silberstein.—p. 1042.
Study of Chemical Composition and Antigenic Properties of Polysaccharide Fraction of Three Hour Cultures of Staphylococcus Aureus. O. N. Fellowes and J. I. Routh.—p. 1054.
Serial Biopsy Studies of Effects of Estrogens on Liver: Chemical and Morphologic Responses to Diethylstilbestrol and Estradiol. H. K. Roberts, E. B. Helwig, R. Elman and C. M. MacBryde.—p. 1062.
Effects of Ether Anesthesia on Total Erythrocyte and White Cell Counts of Adult Female Rats. R. C. Crafts.—p. 1070.
*Vasospastic Factor in Serum of Case of Raynaud's Disease with Cold Agglutination, Experiments on Rabbits. T. H. C. Benians.—p. 1074.
Cold Susceptible Globulin Fraction of Pathologic Sera. E. Wertheimer and L. Stein.—p. 1082.

Vasospastic Factor in Serum in Raynaud's Disease.—Benians found in a patient with Raynaud's disease that her serum contained cold autohemagglutinins. The serum had a high titer of cold antibodies. It was found to cause fatal pulmonary artery spasm in rabbits when given cold intravenously. This effect was mitigated by giving the serum warm. It is suggested that these cold antibodies have a direct effect, probably of an allergic type, on arterial musculature both in the experimental animal and in the clinical case. The frequent association of cold antibodies with a Wassermann-like body points to an origin of the former from diseased vascular structures, and this again would help to explain their action on both blood cells and vessels. Cold agglutinins are a normal constituent of the blood plasma. They might possibly have a function in the normal vascular control. This function would lie in stopping the blood flow in an excessively cooled part at the periphery and so preventing further loss of heat in the blood still circulating. Preliminary experiments in protection against the cold antibodies by the intravenous injection of lipoids have

been carried out with some success. The author stresses that the point at issue is that arterial spasm results directly from the action of "cold antibodies." The experiments relate to the serum of a patient which contains cold panhemagglutinins in high titer and some lysins. This patient suffered from Raynaud's syndrome when cooled and, when really cold, exhibted a condition that may be called shock, with a feeling of constriction in the chest, shortness of breath, pale pinched facies and blueness of the extremities. Her serum injected cold into rabbits caused lysis with rapid death due to spasm of arteries. It seems likely that this violent effect in the rabbit has its counterpart in a mild and reversible form in the patient and that both could be regarded as allergic phenomena.

Journal of Neurophysiology, Springfield, Ill.

7:255-322 (Sept.) 1944

Relation of Cerebral Cortex to Spasticity and Flaccidity. W. K. Welch and Margaret A. Kennard.—p. 255.
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Supernormal Period in Recovery Cycle of Motoneurons. H. E. Hoff and R. S. Grant.—p. 305.

Journal of Nutrition, Philadelphia

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Digestibility and Biologic Value of Soybean Protein in Whole Soybeans, Soybean Flour and Soybean Milk. W. M. Cahill, L. J. Schroeder and A. H. Smith.—p. 209.

Journal of Pediatrics, St. Louis

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*Chylothorax in Infancy: Observations on Absorption of Vitamins A and D and on Intravenous Replacement of Aspirated Chyle. G. B. Forbes.—p. 191.
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Myasthenia Gravis—Its Occurrence in 7 Year Old Female Child. M. D. Yahr and T. K. Davis.—p. 218.
*Congenital and Infantile Beriberi. D. W. Van Gelder and F. U. Darby—p. 226.
Combined Immunization Against Diphtheria, Tetanus and Pertussis. P. M. Hamilton and E. G. Knouf.—p. 236.
Erythroblastosis Fetalis: Case Report. E. B. Brandes and H. R. Cushman.—p. 239.
Bismuth Suppositories (Analbis) in Throat Infections: Bacteriology and Pharmacology: Effectiveness, Absorption, Excretion, Toxicity, S. Silber.—p. 244.
Obstructive Emphysema in Infancy Due to Tuberculous Mediastinal Glands: Report of Case. L. G. Pray.—p. 253.
Studies of Nutritional State of Children in Unoccupied France in Fall of 1942: Preliminary Report. H. C. Stuart.—p. 257.

Chylothorax in Infancy.—Forbes reports a case of chylous effusion in a 6 week old infant with spontaneous bilateral chylothorax. The problem of maintaining a state of adequate nutrition in this type of patient is an important one, as the withdrawal of large amounts of chyle rich in both fat and protein must be repeatedly carried out in the course of the treatment to relieve and prevent severe dyspnea. Some observations have been made on replacement of the aspirated chyle intravenously. In some reported cases this procedure was of considerable benefit, in others it effected no response and in still others sudden death took place which was interpreted as an anaphylactic reaction. Since chyle normally enters the systemic circulation by way of the subclavian vein, it seems unlikely that such reactions could occur entirely as a result of anaphylaxis. In the case here reported, considerable amounts of the chylous fluid were injected intravenously without ill effects. However, the child succumbed despite repeated thoracenteses and vigorous supportive therapy over a period of two months. Postmortem examination failed to reveal a cause for the chylous effusion. Absorption tests with vitamins A and D and beta carotene were performed. Vitamins A and D were rapidly absorbed into the chyle from the gastrointestinal tract and in appreciable quantities. Beta carotene was poorly absorbed. Aspirated chyle was administered intravenously many times without untoward reactions. The loss of protein through the repeated aspiration of chyle is fully as important as that of fat, if not more so. Supportive therapy in cases of chylothorax should include measures to maintain body protein stores.

Congenital and Infantile Beriberi.—Van Gelder and Darby describe a case of congenital beriberi. The infant was cyanotic and almost aphonic, with extreme tachycardia and a greatly enlarged heart. Spectacular improvement resulted from the use of large parenteral doses of thiamine hydrochloride. Urinary thiamine assays and dextrose, pyruvate and lactate blood levels, fasting and following ingestion of dextrose, indicated a state of thiamine deficiency in the mother. Despite a wholly inadequate antepartum diet the mother did not exhibt clinical signs of beriberi. Although the mother had a subclinical attack of beriberi, the infant was born with severe, almost fatal, manifestations. It is difficult to explain this difference in degree of objective evidence of avitaminosis between mother and infant, but the case illustrates well that one should be on guard when a pregnant woman has been subsisting on a poor diet. The authors suggest that some cases of "congenital idiopathic cardiac hypertrophy" or "status thymicolymphaticus" may actually be instances of unrecognized congenital or infantile beriberi. Infants with large hearts in whom no valvular or congenital lesion can be demonstrated should be given large parenteral doses of thiamine hydrochloride as a therapeutic test. During pregnancy and lactation a mother should be provided with an adequate intake of vitamin B. If the maternal diet is suboptimal, the nursing infant should receive additional vitamin B_1 until such time as other foods containing this vitamin are introduced.

Journal Pharmacology & Exper. Therap., Baltimore

81:307-416 (Aug.) 1944

Pharmacologic Basis for Rational Use of Atabrine in Treatment of Malaria. J. A. Shannon, D. P. Earle Jr., B. B. Brodie, J. V. Taggart, R. W. Berliner and resident staff of research service.—p. 307.
Iodine in Blood and Thyroid: VII. Analytic Procedure for Use with Small Samples: Pharmacologic Range of Concentrations. T. S. Sappington, N. Halperin and W. T. Salter.—p. 331.
Changes in Activity of Pulmonary Receptors in Anesthesia and Their Influence on Respiratory Behavior. D. Whitteridge and E. Bulbring.—p. 340.
Some Comparative Pharmacologic Actions of Beta-Hydroxy and Methoxy Phenyl-n-Propylamines. B. E. Graham and G. F. Cartland.—p. 360.
General Analgesic Effects of Procaine. N. Bigelow and I. Harrison. —p. 368.
Oxidation in Vitro of Morphine by Rat Liver Slices. F. Bernheim and Mary L. C. Bernheim.—p. 374.
Digitalis Cat Assay in Relation to Rate of Injection. C. I. Bliss and M. G. Allmark.—p. 378.
*Streptothricin as Chemotherapeutic Agent. H. J. Robinson and Dorothy G. Smith.—p. 390.
Comparative Anticonvulsive Action of 3,5,5-Trimethyloxazolidine-2,4-Dione (Tridione), Dilantin and Phenobarbital. G. M. Everett and R. K. Richards.—p. 402.

Streptothricin as Chemotherapeutic Agent.—Robinson and Smith report on the efficacy of crude streptothricin in a variety of bacterial infections and also in infections produced by Trypanosoma equiperdum and the virus of epidemic influenza. In vitro and in vivo studies showed that crude streptothricin possesses great activity against a variety of gram negative bacterial species. Gram positive forms are also sensitive to the action of streptothricin, but not to the same degree as the gram negative forms. The activity of streptothricin is not influenced by blood, serum, peptone or vitamins of the B complex. Streptothricin is more active when given parenterally than when administered by mouth. The drug is not active against the virus of epidemic influenza or Trypanosoma equiperdum. The ultimate chemotherapeutic index of streptothricin will depend on the toxicity of the pure product. The results suggest that streptothricin may be useful in the local treatment of infected wounds and burns as well as in bacillary dysentery, typhoid and food poisoning produced by the Salmonella organisms.

Journal of Urology, Baltimore

52:177-282 (Sept.) 1944

The Urologist of the Future. C. E. Burford.—p. 177.
*Renal Calculus with Parathyroid Adenoma. G. S. Foulds.—p. 180.
Renal Hydrocele: Subcapsular Renal Extravasation. L. H. Baretz. —p. 184.
Aneurysm of Renal Artery—True and False—with Special Reference to Preoperative Diagnosis. J. A. Lazarus and M. S. Marks.—p. 199.
Nonfibrous Vesicoureteral Obstruction. J. F. McCahey and J. S. Fetter.—p. 216.
Uterocutaneous Transplantation: New Procedure. A. E. Goldstein and E. F. Berman.—p. 224.
Ureterocele with Extrusion Through Urethra. C. J. E. Kickham. —p. 235.
New Use for Old Instrument in Certain Difficult Cases of Vesicovaginal Fistula. G. L. Hunner.—p. 238.
Subtotal Perineal Prostatectomy: Presentation of New Technic. V. F. Marshall.—p. 250.
Rhabdomyosarcoma of Spermatic Cord. C. H. DeT. Shivers.—p. 266.
Renal Complications of Sulfonamide Administration, with Report of Reactions from Sulfathiazole and Sulfadiazine. H. A. Zide.—p. 275.

Renal Calculus with Parathyroid Adenoma.—A woman over a period of several years had formed stones in both kidneys. Although her blood calcium was significantly raised, the normal blood phosphorus and the oxalate type of stone and lack of bone changes led Foulds to abandon the diagnosis of hyperparathyroidism. Eight years later, when unmistakable findings were present, such as bilateral renal calculi, bone pain, fatigue, weakness, x-ray evidence of osteitis fibrosa cystica, elevated blood calcium levels and decreased blood phosphorus levels, the correct diagnosis was made and proved by operation and pathologic examination of the adenoma which had been removed. The diagnosis could have been made earlier had the author appreciated the full significance of his earlier findings.

Maine Medical Association Journal, Portland

35:173-188 (Sept.) 1944

Presidential Address Maine Hospital Association, 1944. F. T. Hill. —p. 173.
Some Intangibles Which Effect Hospital Administration. J. C. Doane. —p. 175.

35:189-206 (Oct.) 1944

Meningococcic Infections with Report of 35 Cases. R. Haas.—p. 190.
Multiple Carcinoid Tumors of Ileum: Report of Case. A. P. Royal Jr.—p. 193.

Minnesota Medicine, St. Paul

27:681-776 (Sept.) 1944

Medical Management of Peptic Ulcer. J. A. Lepak.—p. 703.
Surgical Treatment of Peptic Ulcer. M. G. Gillespie.—p. 706.
Roentgenologic Diagnosis of Peptic Ulcer. W. H. Ude.—p. 712.
Clinical Aspects of Ulcer Problem: With Special Reference to (1) Definition of Criteria of Suitable Operation, (2) Importance of Short Afferent Loop and (3) Results of Operation. O. H. Wangensteen.—p. 714.
Consideration of Certain Unsolved Problems in Cardiology. F. A. Willius.—p. 722.
Analysis of Obstetric Deaths Due to Hemorrhage. Minnesota Medical Mortality Committee.—p. 726.
Malignant Hepatoma in Infant. S. N. Litman and A. H. Wells. —p. 731.

New England Journal of Medicine, Boston

231: 437-476 (Sept. 28) 1944

*Abnormal Carbohydrate Metabolism in Human Thermal Burns: Preliminary Observations. F. H. L. Taylor, S. M. Levenson and Margaret A. Adams.—p. 437.
War Neurosis. S. H. Epstein.—p. 446.
Spontaneous Pneumoperitoneum from Unknown Cause: Report of Case. N. Sidel and A. Wolbarsht.—p. 450.
Modern Concepts of Renal Structure and Function in Chronic Bright's Disease (concluded). S. E. Bradley.—p. 452.

Abnormal Carbohydrate Metabolism in Burns.—Taylor and his associates review observations on 35 consecutive patients with burns admitted to the Boston City Hospital. These patients exhibited a high incidence of hyperglycemia, lactacidemia and a moderate reduction in the carbon dioxide combining power of the plasma. There is a high degree of correlation between these abnormalities of carbohydrate metabolism and the severity of the burn. The few glucose tolerance tests that were made indicate that in some severely burned patients with hyperglycemia there remains a considerable ability to metabolize added glucose. There was no evidence of liver damage in these patients as a result of the burn injury. In the few cases in which liver damage was found, it was present before the injury, being for the most part an alcoholic cirrhosis. The described abnormalities in the carbohydrate metabolism are not inconsistent with the presence of an increased glycogenolysis, together with a possible gluconeogenesis from protein.

New York State Journal of Medicine, New York

44:2063-2174 (Oct. 1) 1944

Problems of Treatment of Tropical Diseases in Returning Military Personnel. H. E. Meleney.—p. 2105.
Periarthritis of Shoulder Joint: Classification, Pathology and Treatment. J. M. Tarsy.—p. 2109.
*Physiopathology, Treatment and Prevention of Frost Injuries, with Special Reference to Frost Injuries in Warfare. P. Liebesny.—p. 2118.
History of Public Health in Chautauqua, Cattaraugus and Allegany Counties. H. R. O'Brien.—p. 2132.
*Diphtheria in "Adequately" Immunized Community. B. F. Mattison. —p. 2138.

Frost Injuries in Warfare.—Liebesny differentiates seven types of frost injuries: (1) erythema and edema, (2) blisters and bullae, (3) superficial gangrene, (4) gangrene of skin and subcutaneous tissue, (5) gangrene of a whole part of an extremity or other parts of the body, especially the ears, (6) injury to muscles, tendons, periost, bone and nerves without or with accompanying lesions of the skin, (7) chronic relapsing lesions of the skin; e. g., chilblains and other forms of erythrocyanosis. Application of heat in frostbite is inadvisable. This is true in first aid as well as in treatment. The defrosting of frozen parts must be done by means of wet dressings with water of 41 to 58 F. Rubbing or massaging of the frozen parts should be avoided. The therapeutic effect of refrigeration in frostbite may be explained partly by its antiphlogistic effect and partly by the fact that it permits only a gradual increase in the temperature of the frozen parts up to normal body temperature, so that there is sufficient time for the improvement of circulation. To achieve improvement in the circulation, short wave therapy of low intensity has been found effective by the author and by Italian clinicians. The short wave current is applied with air spaced electrodes. The treatments are given daily for ten minutes. The current is applied in such a manner that the increase of the temperature of the skin in the treated area does not exceed 0.5 degree C. after ten minutes of application. Recovery is usually accomplished with few treatments. Leriche and Knulin recommended anesthetic infiltration of the lumbar and stellate sympathetic in patients suffering from frostbite with edema and pain. Nearly all patients were immediately relieved. The infiltrations were repeated on the following two days. If there was no necrosis or infarction, patients were well in a few days. Transfusions of plasma in patients suffering from frostbite of large areas and of high degree are advisable. These transfusions should be given during the first twenty-four hours.

Diphtheria in an "Adequately" Immunized Community.—Mattison reviews an outbreak of diphtheria in Kingston, N. Y., a city with a population of 28,000. The previous history of this city with regard to natural and artificial immunity was unusually complete. An extensive Schick survey had been made in 1922 and again in 1938 together with a carrier survey at the later date. The carrier rate had been 0.03 per cent and there had been a decreasing natural immunity. Twenty-eight cases occurred in the 1943-1944 epidemic. The nature of the disease, in general, was mild, especially when toxoid had been given at some earlier date. An analysis of the immunization histories of 1,160 school children indicated a history of past immunization in 75 per cent; reported immunizations among preschool children at the beginning of 1943 indicated that 44 per cent of them were protected. The epidemic occurred predominantly in school age children all of whom had either not been protected, had been given less than the currently recommended toxoid dosage or had been immunized five or more years earlier with no subsequent restimulation. With the available data it is not possible to know whether the outbreak was due to some one or a combination of all of these factors. The decreasing prevalence of diphtheria has brought with it decreasing natural resistance to the disease. Levels of artificial immunization formerly adequate to protect a community may no longer suffice. Suggested steps to maintain the necessary level of community protection

include higher preschool protection rate, reimmunization of all children on entrance to school and administration of complete courses (two doses of alum precipitated toxoid or three doses of fluid toxoid) in every individual immunized.

Ohio State Medical Journal, Columbus

40:805-900 (Sept.) 1944

Treatment of Dysmenorrhea: Practical Considerations. M. Douglass. —p. 821.
Wartime Food Problems. Martha Koehne.—p. 824.
Interesting Side Lights on Epilepsies. J. D. O'Brien.—p. 832.
Catarrhal Jaundice: Epidemic Hepatitis. R. G. Lehman.—p. 835.
Occupational Anemias. K. V. Kitzmiller and R. A. Kehoe.—p. 838.
Current Thinking in Nutrition. J. Forman.—p. 840.
Cystic Fibrosis of Pancreas. R. E. Wolf and R. Johansmann.—p. 844.
Milksickness in Western Country Together with Account of Death of Lincoln's Mother. P. D. Jordan.—p. 848.

Pennsylvania Medical Journal, Harrisburg

48:1-96 (Oct.) 1944

Public Health Aspects of Tropical Diseases of Interest to General Practitioner. C. J. Gentzkow.—p. 15.
Conversion of Former Army and Navy Camps to Preventoria and Rehabilitation Resorts for Tuberculous Patients. J. J. Toland Jr. and I. H. Kornblueh.—p. 21.
*Remissions of Diabetes Mellitus. F. D. W. Lukens and F. C. Dohan. —p. 24.
*Relation of Ovarian Function to Uterine Fibroids. E. M. Baker. —p. 29.

Remissions of Diabetes Mellitus.—According to Lukens and Dohan a remission of diabetes means that the disease has so improved that the blood sugar stays at a normal level without insulin treatment on a diet sufficient to maintain normal weight and strength. Such patients frequently have some abnormality as shown by the glucose tolerance test, and diabetes will usually manifest itself during an infection. Remissions must be distinguished from the normal state in which the tolerance test shows a normal curve and the carbohydrate metabolism is not grossly disturbed by infection. The authors surveyed 517 diabetic patients attending their clinic in the past two years. Of this number 19 (3.7 per cent), in whom the diagnosis of diabetes was unquestionable, were on an adequate diet without insulin for periods of from one month to ten years. In 4 of the patients improvement occurred after dietary treatment alone; in 6 it followed active insulin treatment combined with recovery from infection, and in 9 it resulted from insulin treatment in the absence of complications. The authors feel that the patients of the last group fulfil their criteria most completely, and these 9 remissions in 517 patients give an incidence of 1.7 per cent. This may be compared with 1.4 per cent cited by Joslin. Seventeen of the 19 patients who had remissions were first seen within four months of the onset of diabetes. This fact deserves emphasis, because it stresses the value of early treatment. With the possible exception of infection, the most impressive diminution in the severity of diabetes is seen in the mildly affected obese diabetic patients who respond so well to diet and weight reduction. Many writers have noted the impaired glucose tolerance and diminished response to insulin after high fat diets and the full response to insulin after high carbohydrate diets, even when these are low in calories. The previously untreated diabetic patient, after prolonged, thorough treatment with diet and insulin, responds with a distinct decline in the insulin needed.

Relation of Ovarian Function to Uterine Fibroids.—Baker reviews a series of 36 cases of uterine fibroids. He believes that there is sufficient clinical and pathologic evidence to support the theory that a cause and effect relationship exists between the unopposed and persistent action of the estrogenic principle produced by multiple follicle cysts of the ovaries on the uterine endometrium and myometrium, producing immediate endometrial hyperplasia, and, when the stimulation is sufficiently prolonged, uterine fibroids. All forms of overgrowth of the uterine endometrium and musculature are due to the same factor, namely the estrogenic hormone.

Physiological Reviews, Baltimore

24:409-532 (Oct.) 1944

Factors Affecting Insulin Content of Pancreas. R. E. Haist.—p. 409.
Physiologic Aspects of Human Genetics; Five Human Blood Characteristics. H. H. Strandskov.—p. 445.
Vertebrate Smooth Muscle. E. Fischer.—p. 467.
Water Exchange. J. P. Peters.—p. 491.

Tennessee State Medical Assn. Journal, Nashville

37:291-328 (Sept.) 1944

Diarrhea in Adults. F. E. Marsh.—p. 293.
Drugs on the Market. A. E. Smith.—p. 299.
Performance of Internist in World War II. H. J. Morgan.—p. 304.

Virginia Medical Monthly, Richmond

71:445-496 (Sept.) 1944

Recent Advance in Naval Medicine. J. J. A. McMullin.—p. 446.
Treatment of Acute and Subacute Anterior Poliomyelitis. C. J. Frankel. —p. 451.
Modern Trends in Psychiatry. W. Overholser.—p. 453.
Present Trends of Psychiatry in Army. W. C. Menninger.—p. 461.
Treatment of Alcoholic Addiction. D. C. Wilson.—p. 468.
Diabetic Coma. W. R. Jordan.—p. 473.
Recurrent, Nontraumatic Rupture of Urinary Bladder: Case Report. F. Pole.—p. 477.

War Medicine, Chicago

6:139-216 (Sept.) 1944

*Rheumatic Fever in Canadian Army. W. R. Feasby.—p. 139.
Duty Problem and Psychiatric Casualty: Rapid Method of Decision. R. S. Schwab.—p. 144.
Management of Dyspeptic Soldier in Staging Area. H. Schildkrout. —p. 151.
Electronarcosis: Clinical Comparison with Electroshock. G. N. Thompson, J. E. McGinnis, A. van Harreveld, C. A. G. Wiersma and Esther Bogen Tietz.—p. 158.
Military Aspects of Narcolepsy. M. Levin.—p. 162.
War Neurosis: Psychiatric Experiences and Management on Pacific Island. M. A. Zeligs.—p. 166.
Cerebral Metabolism in Experimental Head Injury. E. S. Gurdjian, J. E. Webster and W. E. Stone.—p. 173.
*Gramicidin S and Its Use in Treatment of Infected Wounds. G. F. Gause and M. G. Brazhnikova.—p. 180.
Comparison of Altitude and Exercise with Respect to Decompression Sickness. S. F. Cook, O. L. Williams, W. R. Lyons and J. H. Lawrence.—p. 182.

Rheumatic Fever in Canadian Army.—Acute (febrile) polyarthritis of unknown etiology is the term used in the Canadian army to designate a condition characterized by swollen joints, fever, rapid pulse and elevated sedimentation rate. Patients with this disease respond well to rest and salicylate therapy. Feasby reviews the 407 cases of "polyarthritis" and acute rheumatic fever which occurred among army personnel in Canada during 1943. It was found that about 4 per cent of persons with streptococcic disease of the respiratory tract acquired polyarthritis. The incidence of polyarthritis closely follows the incidence of streptococcic disease of the respiratory tract. Ninety per cent of the cases occurred in the first seven months of the year. Military populations most seriously affected were those of Saskatchewan and Alberta. No particular strain of streptococci accounts for these cases or their complications. The commonest type was A 19, which was predominant in the 1943 streptococcic epidemic at Camp Borden, Ontario. Follow up of the 407 patients revealed that 24 had cardiac complications. A total of 242, or 60 per cent, of the 407 patients with polyarthritis have been discharged and may be pensioned. Sixty-six of these had other conditions which were of greater importance as the cause of discharge. Twenty-three per cent of the patients are still on full duty and 17 per cent are on limited duty. Preventive measures include proper dust control in sleeping quarters and adequate hospital isolation of persons with streptococcic illness.

Gramicidin S and Its Use in Treatment of Infected Wounds.—Gause and Brazhnikova studied the clinical application of gramicidin S in 573 cases. The original 4 per cent alcoholic solution of gramicidin was diluted with water to make the concentration of gramicidin 400 to 800 micrograms per cubic centimeter of the liquid. These solutions were applied daily either locally or introduced into cavities. The results can be summarized as follows: The first group included cases of septic gunshot wounds of the hip; suppuration following heavy burns of the abdomen, breasts, hips and hands; abscesses of the abdominal wall; heavy anaerobic phlegmons and others. The application of gramicidin S led to (1) rapid disappearance of bacteria in the wound and successful epithelization, (2) successful preparation of the wound for subsequent surgical treatment and (3) in some cases disappearance of the septic state through elimination of the local suppurative process. Gramicidin S was used also in cases of septic gunshot wounds of the larynx and chronic otitis, in empyema and in osteomyelitis.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

14:1-72 (July) 1944

Rational Treatment of Gunshot Wounds of Long Bones with Established Sepsis. H. Turnbull.—p. 3.
Plastic Principles in Common Surgical Procedures. B. K. Rank.—p. 14.
Abdominal Surgery in Forward Areas: Observations Made in Casualty Clearing Station, 1941-1943. L. S. Rogers.—p. 37.
Physical Considerations in Empyema Thoracis. E. S. J. King and E. R. Trethewie.—p. 42.

British Journal of Industrial Medicine, London

1:145-206 (July) 1944

Industrial Health Research: Work of Industrial Health Research Board, 1918-1944. R. S. F. Schilling.—p. 145.
Health Hazards of Coal Mining. S. W. Fisher.—p. 153.
*Effect of Aluminum and Alumina on Lung in Grinders of Duralumin Aeroplane Propellers. D. Hunter, R. Milton, K. M. A. Perry and D. R. Thompson.—p. 159.
Relative Sterility of Hands of Certain Metal Workers. I. Lominski and G. R. Thomson.—p. 165.
Physical Nature of Radiations Used in Industry. G. D. Rochester.—p. 168.
Medical Aspects of Radiations Used in Industry. Ethel Browning.—p. 170.
Working Capacity After Thyroidectomy. W. L. Scott and J. W. Parks.—p. 176.
*Subcutaneous Emphysema Due to Compressed Air. G. P. B. Whitwell.—p. 179.
Brightness, Well-Being and Work. H. C. Weston.—p. 180.

Effect of Aluminum on Lung in Grinders of Duralumin.—Hunter and his associates investigated the health of airplane propeller grinders. A comprehensive study of the environmental conditions was carried out in a particular factory, and physical analyses of the atmosphere content of aluminum have been made close to the grinders' mouths and in the general atmosphere of the shop. All the grinders and polishers of propellers in one factory were interviewed and their occupational histories were taken. Twenty-seven claimed to have some cough and 10 to be somewhat short of breath, but these symptoms did not appear to cause them inconvenience. The sick records of the group were examined and compared with a similar group of workers in a machine shop belonging to the same company. This analysis showed no difference of statistical significance between the two groups. Blood counts and x-ray examinations were made on duralumin propeller grinders. Fifteen by 12 inch roentgenograms were taken in 92 of 97 workers who were exposed to aluminum dust. There was no evidence in any of them of reticulation. In 7 instances there were shadows in the peripheral part of the lung which were different from the ones usually found in this situation. It is conceivable that they may be due to concretions of aluminum dust. They were not related to symptoms. The authors conclude that there is no evidence that the dust to which the grinders are exposed produces any disease of the trachea, bronchi or lungs.

Subcutaneous Emphysema Due to Compressed Air.—Whitwell states that, apart from its use with pneumatic tools, compressed air is commonly used in the engineering industry (*a*) as a coolant and (*b*) to blow away metal particles from the cutting area of machine tools. If the operator has already sustained skin trauma there is a risk of air entering the wound and causing subcutaneous emphysema. A piece of metal pierced the pulp of the middle left finger of a man while he was milling a steel component. He removed it and continued to work, holding the components in his left hand while he used the compressed air on them. In a few minutes the injured finger had become white. The terminal part of the finger was white, insensitive and slightly tense. An hour and forty minutes later he had the typical "crackling" swelling of emphysema over the dorsum of the hand and on the radial side of the extensor surface of the forearm as far as the elbow. There was no further extension of the swelling, but the finger was then red and aching. He was sent home, and the condition disappeared within twenty-four hours. No sepsis developed and there were no untoward results.

Indian Medical Gazette, Calcutta

79:297-344 (July) 1944

Tetanus Neonatorum in Tropics: Suggestion for Its Reduction. L. Rogers.—p. 297.
*Polyneuritis, with Special Reference to Acute Varieties. M. A. Pirzada.—p. 298.
Determination of Blood Groups from Meals of Blood-Sucking Insects. S. D. S. Greval, J. N. Bhattacharji and B. C. Das.—p. 303.
Chemical Method of Obtaining Dry Blood Proteins for Transfusion Purposes. K. V. Krishnan and E. K. Narayanan.—p. 304.
Pyrogenic Reactions Following Intravenous Saline Infusions. B. M. Paul and B. C. Chatterjee.—p. 305.
Talipes Equinovarus. H. C. Aldrich.—p. 307.
Vitamin B Deficiency States Among Women in Mysore: A Survey of Cases Admitted into Female Medical Wards, Krishnarajendra Hospital, Mysore, During 1943. M. Puttaiya.—p. 310.
Primary Pneumococcal Serofibrinous Pleurisy. P. N. Laha.—p. 314.
Neurotic Guilt Complex Uncovered. W. Brinitzer.—p. 315.

Polyneuritis, Particularly Acute Varieties.—Pirzada observed 6 cases of acute polyneuritis in a period of about two years. During the same period he observed only 5 cases of chronic polyneuritis. The essential feature of acute infective polyneuritis is extensive paralysis of sudden onset from which the patient recovers rapidly if he does not succumb. Three cases of this type are described. The disease appears to be relatively benign, possibly because of infection with a virus of low virulence. A less acute and milder form of polyneuritis with a protracted course and of unknown etiology is described by Walshe. Three cases described in the text belong to this variety. In the cases observed by Pirzada, however, syphilis appears to be one of the etiologic factors. Vitamin B_1 deficiency is not believed to play a part in the direct causation of acute polyneuritis, but it has been suggested that subclinical deficiency may be a predisposing factor and a specific virus and Treponema pallidum precipitating factors. The efficacy of vitamin B_1 therapy in polyneuritis, particularly in the acute forms, is open to doubt, but Pirzada's experience suggests that it is worthy of further trial under controlled conditions. In chronic polyneuritis an etiologic factor can usually be found. In the 5 chronic cases mentioned by the author leprosy, nutritional factors, diabetes and typhoid were etiologic factors.

Medicina, Madrid

12:545-628 (Aug.) 1944. **Partial Index**

*Acute Nontuberculous Pleural Empyema. M. González Ribas.—p. 553.
Endometriosis of Genital Organs. J. M. Bedoya Gonzales.—p. 594.

Acute Nontuberculous Pleural Empyema.—González Ribas practiced closed drainage with intrapleural aspiration according to Monaldi's technic in 9 cases of acute nontuberculous pleural empyema. The condition was secondary to septic infarct following gynecologic operations in 6 cases, to pneumonia in endocarditis lenta in 1 case and to lung abscess in 2 cases. The drainage was carried on for periods of two to six weeks. Three patients recovered. One patient improved. He had to have a pleurotomy complemental to drainage, after which he recovered. Two patients died from new pleural foci shortly after control of the early pleural foci. Two patients died late after control of pleurisy. One died of acute atrophy of the liver and the other from heart insufficiency. A necropsy in the 4 cases showed complete reexpansion of the lung and consequent closure of the pleural cavity. Trauma caused by the establishment of the drainage is minimal. The pleural fluid is removed at a slow rate, and the consequent decompression of the mediastinum is effected slowly and progressively. In very acute cases the procedure can be carried out with the patient in his bed. Rapid sterilization of the pleuritic fluid is obtained in all cases. Reexpansion of the lung and permanent closure of the pleural cavity are obtained in almost all cases. In the rare cases in which the closure of the pleural cavity is not complete the condition of the patient is improved to such an extent that he can have the proper surgical intervention. In rare cases, however, new foci of empyema appear either in the lung areas which were previously normal or in the opposite lung. The course of new foci is fatal. Closed drainage with intrapleural aspiration prevents early postoperative mortality and the development of chronic empyema and of open pneumothorax. The patient can have the proper medical and supportive care in the course of the therapy.

Book Notices

Heart Disease. By Paul Dudley White, M.D., Physician to the Massachusetts General Hospital, Boston. Third edition. Cloth. Price, $9. Pp. 1,025, with 138 illustrations. New York: Macmillan Company, 1944.

The first edition of this book was published in 1931, the second in 1937. Just as the second edition was a vast improvement over the first, so the present volume is further along the road to perfection. The arrangement of the book has not been greatly altered, but it is apparent throughout that the author has taken great pains to revise it in accord with current advances in the cardiovascular field and also to meet the major criticisms made of the earlier editions. As a veteran hewing close to the line, he separates fact and fancy. Hypothetical and unsettled issues are mentioned but not labored; they are, as the author states in his preface, "dismissed with remarks which summarize what we know and what we don't know about them." In accomplishing this admittedly difficult task, he has enhanced the value of his book as a textbook for students as well as a reference book for practitioners.

Appearing for the first time in this edition is a chapter entitled "The Range of the Normal Heart," which is probably the most important and valuable addition that the author has made to his book. Retained in this revision, but deleted from the second edition to save space, are original quotations from men whose names are famous in the field of cardiology. An interesting feature is the addendum dated March 1944 which contains material inadvertently neglected after proof reading, and also a brief discussion of the most important contributions that appeared up to the time the book went to press.

The publishers, although handicapped by the paper shortage, have nevertheless produced a volume which compares favorably in appearance with its predecessors. Although it contains nearly a hundred more pages than the first edition, it is smaller, lighter and easier to handle. As an authoritative treatise on the subject it may be warmly recommended to all students interested in the subject of heart disease.

Hospital Color and Decoration. By Raymond P. Sloan. Cloth. Price, $3.75. Pp. 253, with illustrations. Chicago: Physicians' Record Company, 1944.

There has been a growing realization in recent years that beauty is an essential element in hospital construction. Fortunately this can be achieved without extravagance and without the sacrifice of any of the basic principles involved in the practical utilization of institutional facilities. In the present volume the author shows how cheerful and attractive surroundings can be attained. His principal medium is color, yet he does not overlook the importance of other decorative effects in the planning and arrangement of individual rooms, wards, hospital entrance, lounge, solariums and other units. Careful attention is given to the selection of furnishings, lighting effects, flowers and plants and also to the scientific landscaping of hospital grounds. Excellent illustrations are included and many valuable suggestions, charts and guides with reference to color schemes, plants for the sunroom and outside planting appropriate to the various sections of the United States. A useful bibliography facilitates the selection of other reference material. The book is highly instructive and is written in a pleasing and interesting style. It is a welcome addition to the literature of the hospital field and should be read by all who are interested in hospital construction and service.

Investigaciones sobre fisiopatologia tiroidea. Por C. Picado T. Publicaciones de la Secretaria de salubridad pública. Paper. Pp. 92, with illustrations. San Jose, Costa Rica, 1943.

This little work stems apparently out of the fact that in Costa Rica, in the author's opinion, thyroid dystrophies are due not only to exogenous factors, such as iodine deficiency, but also to endogenous factors. The author believes that special normal physiologic indexes must be established for countries, such as Costa Rica, where climate and other factors influence physiologic functions differently as compared with temperate countries. In studying the etiology of Costa Rican thyroid dystrophies, the author develops a hypothesis advanced in an earlier publication. This hypothesis has to do with the formation of antihormones, and his conclusions fall essentially in line with accepted thought in this connection, so far as the broad principles of antihormone formation are concerned. The author has carried out considerable experimentation on the influence of hormones and antihormones, using serums of various species of animals. As regards human beings, this reaches a focus in the explanation offered for the probable mechanism of the therapeutic action of serum from thyroidectomized animals when injected into hyperthyroid patients. This explanation is that "the thyroidectomized animal's serum contains an excess of thyrostimulin (acting as haptene) which, with the serum as vector, immunizes the receptor patient against his own excess of thyrostimulin." The author makes the mistake of endeavoring to include too many lines of work in this brochure, with the result that his chief conclusions are not clearly set forth. To those interested in the relations between thyroid dystrophies and possible etiologic factors this little work may prove interesting. Many of the illustrations in the book and some of the text consist essentially of a reproduction of earlier work.

Proceedings of the Conference on Problems of Human Fertility. Sponsored by the National Committee on Maternal Health, January 15-16, 1943, New York City. Edited by Earl T. Engle. Cloth. Pp. 182, with illustrations. Menasha, Wis.: George Banta Publishing Company, 1943.

Criteria of ovulation, sperm migration and placental transmission are discussed in twelve papers. Severinghaus feels that there is a dependable relation between pregnandiol in the urine and corpus luteum formation. Rock and Hertig report on 14 very early ova with average ovulation as day 14 preceding expected menstrual period, and slight deviation. Wislocki compares nidation in monkeys at day 9 with the human day 7½. Hartman is unsure of a monkey safe period, his range of ovulation time in 293 animals being from the 9th to the 23d day. Corner declares that corpora lutea in woman and the monkey can be dated fairly accurately, questioning Hartman's bimanual indications. Greulich reports favorably on rectal temperature tests when taken by institution attendants as indicating the time of ovulation, with check by 29 laparotomies and microscopic sections. Rubenstein checked on vaginal smears as an indicator of ovulation by 18 laparotomies. Boling gave electrometric technic.

Lamar found that the spermatozoa in vitro would enter cervix mucus collected at any time during the month, including that of menstruation. This is in contrast to the Hühner and Weisman in vivo tests, which show entry only at midcycle. Rubinstein estimated intravaginal sperm survival as 30 to 180 minutes. Rakoff induced atrophy of vaginal mucosa with testosterone, and Hertig found estrogenic activity of the ovary long after ovulation ceased.

Other chapters discuss biology of the vagina, cytology of the trophoblast and various aspects of placental transmission. The discussions following the papers bore somewhat on the clinical aspects of the topics.

Varicose Veins, Hæmorrhoids and Other Conditions: Their Treatment by Injection. By R. Rowden Foote, M.R.C.S., L.R.C.P., D.R.C.O.G., Physician-In-Charge Injection Clinic, Royal Waterloo Hospital, London. Cloth. Price, 12s. 6d. Pp. 119, with 54 illustrations. London: H. K. Lewis & Co., Ltd., 1944.

This is a short treatise on the indications and technic of sclerosing injections for varicose veins, hemorrhoids, hydrocele, bursa, ganglion, nevus and anal fissure. There is an appendix of useful prescriptions and some points on the organization of an "injection clinic." The text is clear and concise; the illustrations and printing are excellent in spite of having been produced in war torn England. In 115 pages the author has described and summarized all the practical points of injection therapy. An excellent chapter on the operative treatment of varicose veins has been written by Mr. Rodney Maingot. Unusual for the American reader is the combined use of lithium salicylate with quinine (Maingot's solution), which gives a gelatinous mass and is said to avoid cinchonism. This volume is highly recommended for the general practitioner. It contains all he needs to know about this form of treatment.